JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER

HR-S8000U

S-VHS
DIGITAL
HQ
High Quality

SPECIFICATIONS

Format : S-VHS/VHS NTSC standard with Hi-Fi audio
Video recording system : Rotary, two-head helical scan system with slant double-azimuth combination video heads
Hi-Fi audio recording system : Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels : 2 Hi-Fi audio channels
1 normal audio channel
Video signal system : NTSC-type color signal and separated Y/C signals conforming to NTSC.
Tape width : 12.65 mm (1/2 inch)
Tape speed
(SP) : 33.35 mm/s (1-5/16 ips)
(EP) : 11.12 mm/s (7/16 ips)
Maximum recording time
(SP) : 160 min. with T-160 video cassette
(EP) : 480 min. with T-160 video cassette
Temperature
Operating : 5°C to 40°C (41°F to 104°F)
Storage : −20°C to 60°C (−4°F to 140°F)
Antenna : 75 ohms, unbalanced
Channel coverage
(VHF) : Channels 2 − 13
(UHF) : Channels 14 − 69
(CATV) : 113 channels
RF output signal : Channel 3 or 4 (switchable; preset to channel 3 when shipped)
75 ohms, unbalanced
Power requirement : AC 120 V∿, 60 Hz
Power consumption : 48 W
Video
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 45 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at center position
Horizontal resolution : More than 400 lines (S-VHS)/ 240 lines (VHS) with PICTURE SHARPNESS control at center position
Audio
Input : −8 dBs, more than 50 k-ohms, unbalanced
Output level : −6 dBs, high impedance load
Output impedance : Less than 1 k-ohm, unbalanced
Signal-to-noise ratio : More than 40 dB (Normal audio)
Frequency range : 70 Hz to 10,000 Hz (Normal audio)
Hi-Fi audio
Frequency response : 20 Hz to 20,000 Hz
Dynamic range : More than 90 dB
Wow and flutter : Less than 0.005 % WRMS
Timer : 14-day programmable timer
8 programs with repeat function
Dimensions : 467 mm(W) x 107 mm(H) x 373 mm(D)
(18-7/16" x 4-1/4" x 14-11/16")
Weight : 8.4 kg (18.6 lbs)
Provided accessories : Infrared remote control unit
"AA"-size battery x 2
S-VIDEO cable (4-pin)
Matching transformer
Antenna extension cable
Antenna splitter
Antenna cable (F-type)
Audio cable
Video cable
S-VHS cassette tape

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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NOTE: For a technical description, please refer to Technical Guide VTG82019 HR-S8000 NTSC.

TABLE OF CONTENTS

Section Title Page

Important Safety Precautions

INSTRUCTIONS

1. MECHANISM ADJUSTMENT

1.1 GENERAL 1-1
1.2 MAIN ASSEMBLY REPLACEMENT 1-4
1.3 ASSEMBLY PROCEDURE OF MECHANISM 1-6
1.4 CONFIRMATION AND ADJUSTMENT 1-8
1.5 TAPE TRANSPORT CHECKS AND ADJUSTMENT PREPARATIONS 1-9
1.6 INTERCHANGEABILITY CHECKS AND ADJUSTMENTS 1-10

2. ELECTRICAL ADJUSTMENTS

2.1 PREPARATION 2-1
2.2 SWITCHING REGULATOR CIRCUIT 2-3
2.3 TIMER CIRCUIT 2-3
2.4 SERVO CIRCUIT 2-4
2.5 VIDEO CIRCUIT 2-5
2.6 AUDIO CIRCUIT 2-10
2.7 ON SCREEN CIRCUIT 2-11
2.8 IF CIRCUIT 2-11
2.9 DIGITAL CIRCUIT 2-12

3. CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD LOCATIONS 3-1
3.2 GENERAL INFORMATIONS 3-2
3.3 ABBREVIATIONS USED IN THE SCHEMATIC DIAGRAM 3-3
3.4 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS 3-4
3.5 POWER SYSTEM BLOCK DIAGRAM 3-5
3.6 BOARD INTERCONNECTION DIAGRAM 3-6
3.7 PRE/REC AMP BLOCK DIAGRAM 3-8
3.8 SERVO BLOCK DIAGRAM 3-9
3.9 VIDEO BLOCK DIAGRAM 3-10
3.10 AUDIO IN/OUT BLOCK DIAGRAM 3-12
3.11 AUDIO BLOCK DIAGRAM 3-13
3.12 SWITCHING POWER SUPPLY (1) AND SWITCHING POWER SUPPLY (2) SCHEMATIC DIAGRAM 3-14
3.13 SWITCHING POWER SUPPLY (1) AND SWITCHING POWER SUPPLY (2) CIRCUIT BOARDS 3-15
3.14 MECHANISM CONTROL SCHEMATIC DIAGRAM 3-16
3.15 DECK TERMINAL SCHEMATIC DIAGRAMS 3-17
3.16 MECHANISM CONTROL AND DECK TERMINAL CIRCUIT BOARDS 3-18
3.17 VIDEO (REC) SCHEMATIC DIAGRAM 3-20
3.18 VIDEO (PB) SCHEMATIC DIAGRAM 3-22
3.19 SERVO, SERVO SUB SCHEMATIC DIAGRAMS AND SERVO SUB CIRCUIT BOARD 3-24
3.20 MAIN (VIDEO/SERVO) CIRCUIT BOARD 3-25
3.21 PRE/REC SCHEMATIC DIAGRAM 3-26
3.22 PRE/REC AMP (1) AND PRE/REC AMP (2) CIRCUIT BOARDS 3-27
3.23 DIGITAL, DIGITAL SUB, DIGITAL SUB2, CNN AND CNN SUB SCHEMATIC DIAGRAMS 3-28
3.24 DIGITAL, DIGITAL SUB, DIGITAL SUB2, CNN AND CNN SUB CIRCUIT BOARDS 3-29
3.25 AUDIO SCHEMATIC DIAGRAM 3-30
3.26 AUDIO CIRCUIT BOARD 3-31
3.27 AUDIO IN/OUT SCHEMATIC DIAGRAM 3-32
3.28 AUDIO IN/OUT CIRCUIT BOARD 3-33
3.29 TUNER CONTROL SCHEMATIC DIAGRAM 3-34
3.30 TUNER CONTROL CIRCUIT BOARD 3-35
3.31 IF SCHEMATIC DIAGRAM 3-36
3.32 IF CIRCUIT BOARD 3-37
3.33 DEMODULATOR SCHEMATIC DIAGRAM 3-38
3.34 DEMODULATOR CIRCUIT BOARD 3-39
3.35 TIMER SCHEMATIC DIAGRAM 3-40
3.36 TIMER CIRCUIT BOARD 3-41
3.37 DISPLAY SCHEMATIC DIAGRAM 3-42
3.38 DISPLAY CIRCUIT BOARD 3-43
3.39 ON SCREEN AND SYNC SEP/SUB SERVO SCHEMATIC DIAGRAMS 3-44
3.40 ON SCREEN AND SYNC SEP/SUB SERVO CIRCUIT BOARDS 3-45
3.41 CONTROL AND STEP SCHEMATIC DIAGRAMS 3-46
3.42 CONTROL AND STEP CIRCUIT BOARDS 3-47
3.43 POWER SWITCH, LED AND FLYING ERASE SCHEMATIC DIAGRAMS 3-48
3.44 POWER SWITCH, LED AND FLYING ERASE CIRCUIT BOARDS 3-49
3.45 TERMINAL SCHEMATIC DIAGRAM 3-50
3.46 TERMINAL CIRCUIT BOARD 3-51
3.47 SIGNAL SELECTOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD 3-52
3.48 REMOTE CONTROL SCHEMATIC DIAGRAM 3-53
3.49 RF CONVERTER AND RF SWITCH SCHEMATIC DIAGRAM 3-54

4. EXPLODED VIEWS AND PARTS LIST

4.1 STANDARD PART NUMBER CODING 4-1
4.2 CABINET ASSEMBLY <M2> 4-2
4.3 CHASSIS ASSEMBLY <M3> 4-3
4.4 MECHANISM ASSEMBLY (1) <M4> 4-4
MECHANISM ASSEMBLY (2) <M4> 4-4
4.5 PACKING ASSEMBLY <M1> 4-6
4.6 REMOTE CONTROL UNIT <M5> 4-7

5. ELECTRICAL PARTS LIST

5.1 STANDARD PART NUMBER CODING 5-2
SWITCHING POWER SUPPLY BOARD ASSEMBLY <01><02> 5-6
MAIN BOARD ASSEMBLY <03> 5-7
MECHACON BOARD ASSEMBLY <04> 5-15
TERMINAL BOARD ASSEMBLY <06> 5-16
IF BOARD ASSEMBLY <07> 5-16
TUNER CONTROL BOARD ASSEMBLY <08> 5-17
AUDIO BOARD ASSEMBLY <09> 5-17
AUDIO IN/OUT BOARD ASSEMBLY <10> 5-19
AUDIO/CONTROL HEAD BOARD <12> 5-21
DEMODULATOR BOARD ASSEMBLY <14> 5-21
DIGITAL BOARD ASSEMBLY <15> 5-22
SIGNAL SELECT BOARD ASSEMBLY <16> 5-25
ON SCREEN BOARD ASSEMBLY <17> 5-26
TIMER BOARD ASSEMBLY <20> 5-26
CONTROL BOARD ASSEMBLY <24> 5-27
POWER SWITCH/LED BOARD ASSEMBLY <25><32> 5-28
DISPLAY BOARD ASSEMBLY <27> 5-29
STEP BOARD ASSEMBLY <37> 5-29
UPPER DRUM BOARD <41> 5-29
PRE/REC AMP BOARD ASSEMBLY <43> 5-29
FLYING ERASE BOARD ASSEMBLY <46> 5-31
SYNC SEP/SUB SERVO BOARD ASSEMBLY <49> 5-31
DECK TERMINAL BOARD ASSEMBLY <51><53> 5-32
RELAY BOARD ASSEMBLY <52> 5-32
END SENSOR BOARD ASSEMBLY <54> 5-32
CASSETTE HOUSING BOARD <56> 5-32
REMOTE CONTROL BOARD ASSEMBLY <RM> 5-32

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

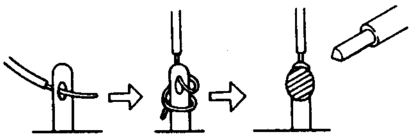


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

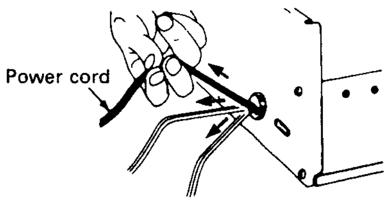


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

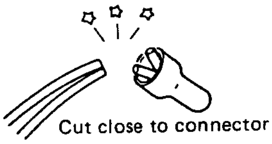


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

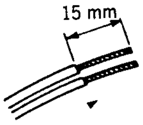


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

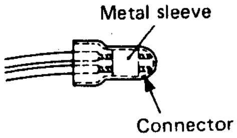


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

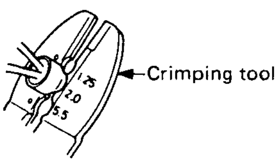


Fig. 6

(5) Check the four points noted in Fig. 7.

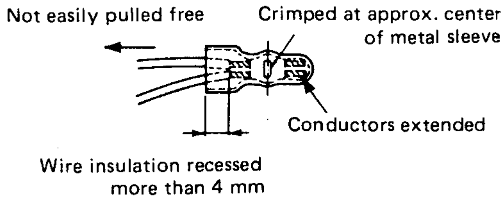

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

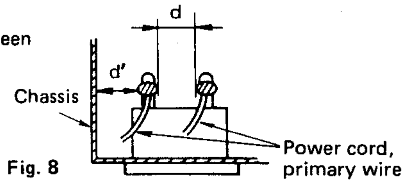


Fig. 8

4. **Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method: (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

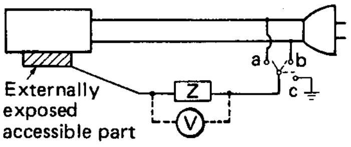


Fig. 9

5. **Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

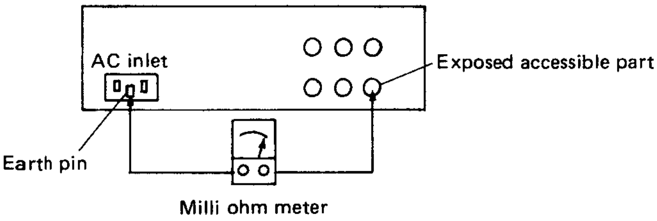


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

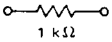
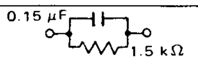
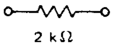
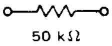
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	 1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 µF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This video cassette recorder should be used with AC 120 V∿, 60 Hz only.
CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

CAUTION
When you are not using the HR-S8000U for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.

CAUTION
TO PREVENT ELECTRIC SHOCK DO NOT USE THIS POLARIZED PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION:
Pour prévenir l'électrocution, ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.

NOTE: The rating plate and the safety caution are on the rear of the unit.

Cassettes marked "S-VHS" and "VHS" can be used with this video cassette recorder. However, S-VHS recordings are possible only with cassettes marked "S-VHS".

Thank you for purchasing the JVC HR-S8000U Super VHS Hi-Fi Stereo Digital Video Cassette Recorder. This unit provides a breath-taking improvement in picture quality, with over 400 lines of picture resolution to double your video enjoyment. True hi-fi stereo complements the superb Super VHS pictures. In addition, a tremendous array of digital functions and other video features are also incorporated in the HR-S8000U.

Before using this video recorder, read this instruction booklet carefully so that you will obtain the best results from your HR-S8000U.

CONTENTS

BASIC INSORMATION

General reference diagrams 4
Features 5
Precautions 6
Controls, indicators and connectors 7
For a better understanding of S-VHS and VHS 11
Connections 13
Video channel setting 14
Operating the built-in tuner 15
Information on the HR-S8000U's audio system 17

BASIC OPERATION

Clock setting 21
Loading and unloading a cassette 22
On-screen channel, time and mode display 22
Playing back a video cassette 23
Special-effects playback 24
Basic operation for recording TV programs 25
Instant timer recording 26
Recording one TV program while watching another 26
Recording stereo TV programs 26
Recording SAP (second audio program) TV programs 26

CONVENIENT FACILITIES

Remaining tape time indicator 27
Next-function memory 27
Index search function 28
Intro search function 29
Counter memory function 29
Counter go-to function 30

DIGITAL FUNCTIONS

Digital freeze function 31
Multi-screen digital freeze function 31
Digital strobe function 32
Multi-screen digital stobe function 32
Digital art effects 33
Digital zoom function 33
Picture-in-picture and swap functions 34
Multi-screen channel scan function 35
Multi-screen intro search function 35

TIMER RECORDING

Automatic timer recording 36
Important information on timer recording 39

ADVANCED USAGE

Recording FM simulcast TV programs 40
Recording a TV program while recording an independent audio source 40
Using the HR-S8000U as an audio deck 40
Audio dubbing 40
Insert editing 41
Tape-to-tape editing 42
Recording with a video camera 42
In case of difficulty 43
Head cleaning 44
Specifications 44
INSTRUCTIONS EN LANGUE FRANÇAISE .... 45 – 86

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A Consumer Video Products Safety Guide

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This unit has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:
Follow and obey all warnings and instructions marked on your video product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this unit and keep this brochure and the operating instructions packaged with your video product for future reference.

INSTALLATION

1. Grounding or Polarization
(A) Your video product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.
If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
(B) Your video product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources
Operate your unit only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. If your unit is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading
Overloaded power outlets and extension cords are dangerous; so are frayed cords and broken plugs. Any of these may result in a shock or fire hazard. Call your service technician for replacement of such cords and plugs. Extension cords or adaptors that defeat the safety purpose of polarized or 3-wire grounding-type plug power cords should not be used.

4. Power Cord Protection
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

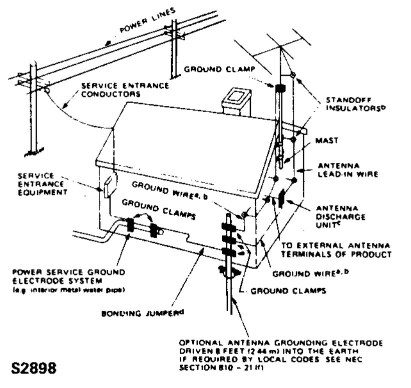
5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the unit and to protect it from overheating, these openings must not be blocked or covered.
- Do not block the openings by placing the unit on a bed, sofa, rug or other similar surface.
- Do not place the unit near or over a radiator or heat register.
- Do not place the unit in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding
If an outside antenna or cable system is connected to the video recorder or tuner, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code. ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

2. Power Lines
To avoid the possibility of a fatal electrical shock, outdoor antennas and lead-in wires should be kept well away from over-head power lines or other electric light or power circuits, or from where they can fall onto such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 – "RADIO AND TELEVISION EQUIPMENT"


POWER LINES
GROUND CLAMP
SERVICE ENTRANCE CONDUCTORS
STANDOFF INSULATORS^b
MAST
ANTENNA LEAD-IN WIRE
SERVICE ENTRANCE EQUIPMENT
GROUND WIRE^a, b
GROUND CLAMPS
ANTENNA DISCHARGE UNIT^c
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
POWER SERVICE GROUND ELECTRODE SYSTEM (e.g. interior metal water pipe)
GROUND WIRE^a, b
GROUND CLAMPS
BONDING JUMPER^d
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44 m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810 – 21 (f)
S2898

a

Use No. 10 AWG (5.3 mm^2) copper, No. 8 AWG (8.4 mm^2) aluminum, No. 17 AWG (1.0 mm^2) copper-clad steel or bronze wire, or larger, as a ground wire.

b

Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 – 6 feet (1.22 – 1.83 m) apart.

c

Mount antenna discharge unit as close as possible to where lead-in enters house.

d

Use jumper wire not smaller than No. 6 AWG (13.3 mm^2) copper, or the equivalent, when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

USE

1. Accessories

To avoid personal injury:

- Do not place this video product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the appliance.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the video product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the appliance.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

1A.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

PORTABLE CART WARNING
(symbol provided by RETAC)

S3126A

2. Water and Moisture

Do not use this video product near water – for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

3. Object and Liquid Entry

Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on this video product.

4. Attachments

Do not use attachments not recommended by the manufacturer of this video product as they may cause hazards.

5. Cleaning

Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6. Lightning

For added protection for the video recorder or tuner during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the video product due to lightning and power-line surges.

SERVICING

1. Servicing

If your video product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service

Unplug the video product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the video product.
c. If the video product has been exposed to rain or water.
d. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
e. If the video product has been dropped or the cabinet has been damaged.
f. When the video product exhibits a distinct change in performance – this indicates a need for service.

3. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

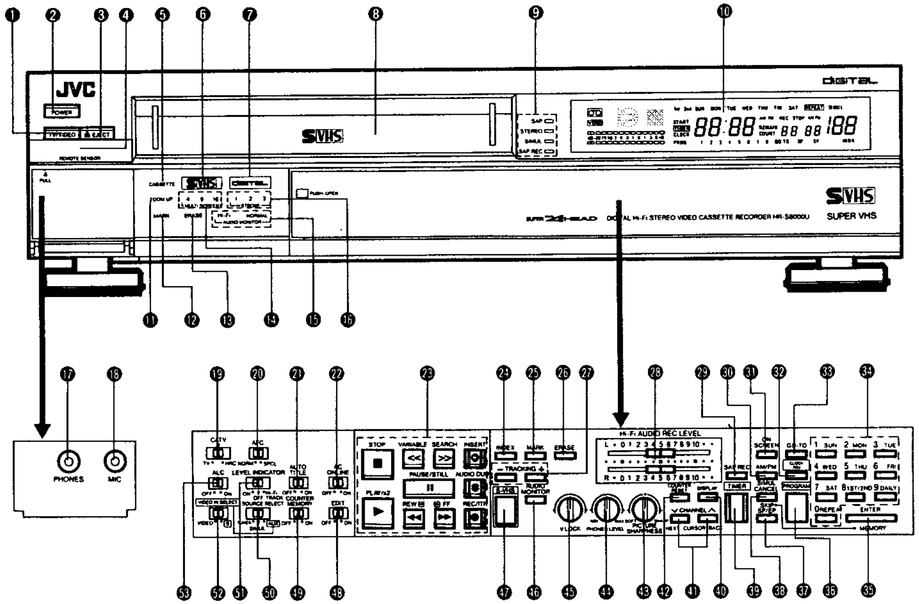
4. Safety Check

Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in safe operating condition.

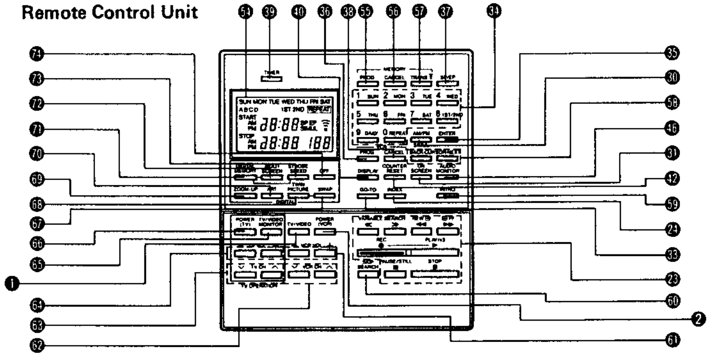
BASIC INFORMATION

GENERAL REFERENCE DIAGRAMS

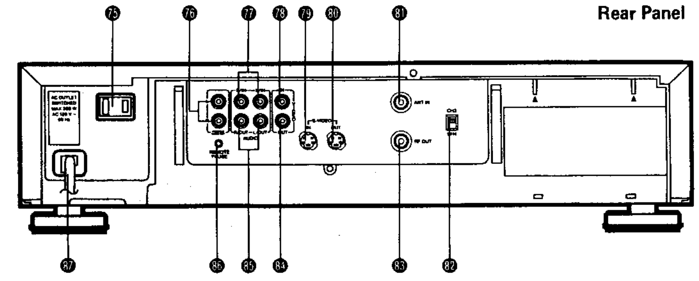
Front Panel


JVC
POWER
TV/VIDEO
EJECT
S-VHS
DIGITAL
SAP
STEREO
SIMUL
SAP REC
SUPER VHS
DIGITAL Hi-Fi STEREO VIDEO CASSETTE RECORDER HR-S8000U
PUSH OPEN
PHONES
MIC
STOP
VARIABLE SEARCH
INSERT
PAUSE/STILL
AUDIO DUB
PLAY
REW
FF
REC/ITR
INDEX
MARK
ERASE
TRACKING
AUDIO MONITOR
Hi-Fi AUDIO REC LEVEL
SAP REC
AM/PM
ON SCREEN
GO-TO
TIMER
CANCEL
PROGRAM
CHANNEL
CURSOR
ENTER
MEMORY
SUN
MON
TUE
WED
THU
FRI
SAT
DAILY
ALC
AFC
CATV
AUTO TITLE
EDIT
V.LOCK
PHONES LEVEL
PICTURE SHARPNESS

Remote Control Unit


TIMER
REPEAT
MEMORY
CANCEL
ENTER
GO-TO
INDEX
POWER
TV/VIDEO
REC
PLAY
PAUSE/STILL
STOP

Rear Panel


ANT IN
RF OUT
CH3
CH4
S-VIDEO
AUDIO
REMOTE PAUSE

FEATURES

High-Quality Pictures and Sound

- **Super VHS recording and playback circuitry** ensuring super-quality pictures with a horizontal resolution of more than 400 lines.
- **Separated Y/C signal terminals (S-VIDEO IN and OUT)** for higher-quality dubbing and playback of Super VHS signals.
- **Full set of HQ (High Quality) System circuits** to ensure the best possible pictures in the regular VHS mode.
- **High-performance CCD luminance signal comb filter** for both Super VHS and VHS operation.
- **Super DA-4 head system** for superlative picture quality in all modes.
- **Hi-Fi VHS stereo sound with a dynamic range of more than 90 dB.**
- **Advanced switching noise reduction system** which applies switching point compensation independently for each channel.

Digital Functions

- **Digital Freeze** to freeze the action, with the soundtrack continuing unaffected.
- **Multi-Screen Digital Freeze** to sequentially display selected still pictures in a 4-, 9- or 16-frame Multi-Screen mode.
- **Digital Strobe** to change "frozen" images in sequence at 3 different speeds.
- **Multi-Screen Digital Strobe** to display still pictures on 4, 9 or 16 sub-screens at 3 different speeds.
- **Picture-In-Picture** to display a TV broadcast program in an inset window during tape playback, with Swap function to switch pictures between the main screen and the window.
- **Digital Mosaic** for modern art expressions available in 2 different patterns.
- **Digital Solarization** for fascinating color changes in 2 different tones.
- **Digital Zoom** to enlarge the center quarter, or any of the four corners, of the picture into a full-screen picture.
- **Multi-Screen Channel Scan** to sequentially display on sub-screens a still picture from each tuned-in channel.
- **Multi-Screen Intro Search** to sequentially display on sub-screens a still picture from the beginning of each recorded program identified by a CTL index code.
- **Automatic Recording of a Multi-Screen Intro Search image:** after the entire tape is scanned, the multi-screen picture is automatically recorded for about 10 seconds at the beginning of the tape.
- **Digitally-enhanced still, 5-step variable slow-motion, and 5-step variable fast-motion playback**

Special Features

- **LCD-programmable, TV/VCR unified remote control;** available functions include:
  - •Independent timer programming using 4 built-in program memories and LCD display; the programmed data can be transferred to the recorder at any convenient time.
  - •On-screen direct 10-key timer programming
  - •All digital functions
  - •All tape access functions
  - •10-Key direct-access channel selection
  - •Audio monitor selection and output level control
  - •Control of television for power on/off, channel selection, TV/VIDEO mode selection and volume setting (designated TVs only)
- **Auto Titler:** date, time and channel are recorded automatically at the beginning of a recording each time recording is initiated, or manually when requested; in playback, this recording data can be displayed on-screen.
- **Flying erase head** for professional-class insert edits.
- **VHS Index Search** with mark/erase functions; the half-loading mechanism allows the detecting of up to 9 index codes in the rewind, fast-forward or Shuttle Search mode.

Other Value Features

• 181-Channel cable-compatible frequency synthesized tuner • Built-in MTS decoder • 14-Day/8-event fully programmable timer • On-screen mode check and programming • Audio dubbing • Edit switch for best possible dubs • Hi-Fi recording level control with ALC switch • Peak-hold audio level indicators/Hi-Fi tracking meter • Variable audio output for more convenience in system integration • Timer-programmable FM simulcast recording • 60-Minute memory backup • Instant timer recording • Skip search • Intro Search • Counter go-to • Counter memory funnction • Next-function memory • Remaining tape time indicator • Automatic functions • Shuttle Search with latch function • Picture sharpness control • Electronic tracking controls • Switchable AC outlet • Headphone jack with adjustable output • Microphone jack

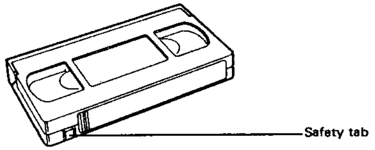
PRECAUTIONS

Handling and storage

- Avoid using the recorder under the following conditions:
  - – extremely hot, cold or humid places,
  - – dusty places,
  - – near appliances generating strong magnetic fields,
  - – places subject to vibrations, and
  - – poorly ventilated places.
- Be careful of moisture condensation.
  Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapor in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportation,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs S-VHS and VHS cassettes only.
  S-VHS: ST-120 for 120(SP)/360(EP) minutes, ST-60 for 60/180 minutes and ST-30 for 30/90 minutes of recording.
  VHS: T-160 for 160(SP)/480(EP) minutes, T-120 for 120/360 minutes, T-90 for 90/270 minutes, T-60 for 60/180 minutes and T-30 for 30/90 minutes of recording.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

Moisture condensation

- If you pour a cold liquid into a glass, water vapor in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the POWER switch set to ON; this would help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

Operation

- When a cassette is loaded, the power is switched on and, if the safety tab has been removed, playback begins automatically.
- The cassette can be unloaded even when the power is off. Pressing the EJECT button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the TIMER button is engaged with the TIMER indicator lit, the POWER and EJECT buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automatic loading, the Timer Recording Standby mode will be engaged with power off.

Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit or dampen the terminals.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

CONTROLS, INDICATORS AND CONNECTORS

Front Panel

① **TV/VIDEO button**
Selects between TV and VIDEO modes.
TV mode (the VIDEO indicator on the fluorescent display [FDP] is off): for TV viewing and for watching a TV program while recording another.
VIDEO mode ("VIDEO" appears on the FDP): for recording a TV program while watching it and for playing back recorded tapes. When the power is switched on, initially the TV mode is engaged. If you want to change the mode, press the TV/VIDEO button.

② **POWER button with green indicator**
Press to apply power to the HR-S8000U for recording or playback. The indicator will light. Loading a cassette also turns the power on.

③ **Cassette EJECT button**

④ **Infrared beam receiving window (REMOTE SENSOR)**

⑤ **S-VHS CASSETTE indicator**
This LED lights when a cassette marked S-VHS is inserted, with the cassette mark also appearing on the fluorescent display panel (FDP). With a regular VHS cassette, only the cassette mark on the FDP lights.

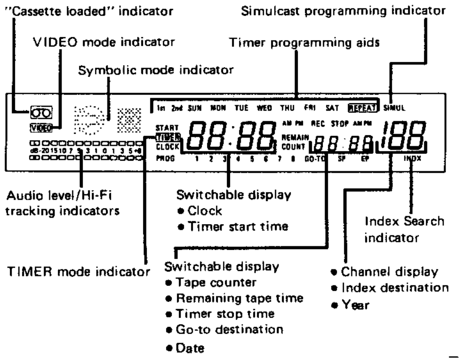
⑥ **S-VHS mode indicator**
The "S-VHS" indicator illuminates when the S-VHS recording mode is selected with the S-VHS mode select button ㊼ or when S-VHS recordings are being played back. In playback, S-VHS recordings are automatically detected and played back in the S-VHS mode.

⑦ **DIGITAL indicator**
Lights when a digital function is in operation.

⑧ **Cassette loading slot**
Insert a VHS video cassette. The door will close and the indicator showing that a cassette is inside will appear on the FDP.

⑨ **Audio program indicators**
SAP: Lights when a TV program accompanied by a second audio program is being received.
STEREO: Lights when a stereophonic program is being received.
SIMUL: Lights when the SOURCE SELECT switch ㊿ is set to SIMUL.
SAP REC: Lights when the SAP REC button ㉙ is pressed to record a second audio program on the normal audio track.

⑩ **Comprehensive fluorescent display panel (FDP)**
Fully explained in relevant sections.



⑪ **ZOOM UP indicator**
Lights when the Digital Zoom is engaged.

⑫ **MARK indicator**
Blinks while an index code is being recorded.

⑬ **ERASE indicator**
Blinks while an index code is being erased. (The Erase mode is engaged by pressing the ERASE button.)

⑭ **MULTI SCREEN indicators**
An indicator (4, 9 or 16) corresponding to the selected number of sub-screens lights in the Multi-Screen mode.

⑮ **AUDIO MONITOR indicators**
The Hi-Fi indicator lights when Hi-Fi audio is selected with the AUDIO MONITOR button ㊻; the NORMAL indicator lights when normal audio is selected. Both indicators light when a mixture of the two is selected.

⑯ **STROBE indicators**
An indicator (1, 2 or 3) corresponding to the selected strobe speed lights in the Strobe mode.

⑰ **PHONES jack**
Connect a set of headphones for monitoring or private listening.

⑱ **MIC jack**
Connect a microphone for audio dubbing.

⑲ **Band select switch (TV/CATV/HRC)**
TV position: If your antenna system is regular broadcast VHF/UHF, VHF only or UHF only, set to this position.
CATV position: If your antenna system is a Cable TV Line with or without a CATV channel converter/decoder unit, set to this position.
HRC position: If your antenna system is an HRC (Harmonic Related Carrier) line, set to this position.

⑳ **AFC switch**
Normally set this switch to NOR. If no picture appears, reset the switch to SPCL.

㉑ **AUTO TITLE switch**
When this switch is set to ON, the date, time and channel are automatically recorded at the beginning of a recording each time recording is initiated from the Stop or Timer Standby mode. (See page 25.)

㉒ **AC ONLINE switch**
OFF position: Power flows through the rear panel AC OUTLET (75) regardless of whether the recorder is on or off.
ON position: Power flows only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment.

㉓ **Tape control buttons**

- **STOP button**
  To stop the tape.
- **PLAY/x2 button**
  Press once to play back a tape; press again for double-speed playback. Also press this button to cancel the Pause/Still, Slow or Shuttle Search mode. (See page 24.)
- **REC/ITR button**
  Press once for normal recording; again for instant timer recording; each subsequent press adds 30 minutes to the recording time to a maximum of 4 hours. (See page 26.)

- **PAUSE/STILL button**
  Press to stop the tape temporarily to avoid recording of unwanted material or to view a still picture. The still picture can be advanced each time this button is pressed.
- **REW button**
  To rewind the tape, press this button while in the Stop mode. To view the speeded-up picture in the reverse direction for program search, press this button while in the Play mode; press the PLAY/x2 button to return to normal playback. (See page 24.)
- **FF button**
  To fast forward the tape, press this button while in the Stop mode. To view the speeded-up picture in the forward direction for program search, press this button while in the Play mode; press the PLAY/x2 button to return to normal playback. (See page 24.)
- **VARIABLE SEARCH buttons**
  To control the search speed; both slow-motion and fast-motion search are available. The slow-motion speed can be changed in 5 steps; 1/6, 1/12, 1/18, 1/24 and 1/30 normal speed. For fast-motion search, available speeds are x1, x3, x5 and x7 in both directions and x2 in the forward direction in the SP mode; x1, x3, x5, x7 and x21 in both directions and x2 in the forward direction in the EP mode. No audio is available in the Variable Search mode. To cancel the Variable Search mode, press the PLAY/x2 button. (See page 24.)
- **INSERT button**
  Press for insert editing. (See page 41.)
- **AUDIO DUB button**
  Press together with the PLAY/x2 button for audio dubbing. (See page 40.)

㉔ **INDEX button**
Press to engage the Index Search mode. (See page 28.)

㉕ **MARK button**
Press during playback or recording to put an index code onto the tape. (See page 28.)

㉖ **ERASE button**
Press during playback to erase an index code. (See page 28.)

㉗ **TRACKING –/+ buttons**
If noise bars are seen during playback, use these buttons to reduce them. The tracking is reset to normal when both buttons are pressed together, a cassette ejected, or the power turned off.
These TRACKING buttons can also be used to adjust hi-fi tracking, referring to the hi-fi tracking meter. (See page 20.)

㉘ **Hi-Fi AUDIO REC LEVEL controls**
See page 19.

㉙ **SAP REC button**
Press this button when recording the SAP program on the normal audio track. The SAP REC indicator ⑨ will light.

㉚ **AM/PM/SIMUL button**
Press this button to specify AM or PM in clock or timer setting. This button is also used to program timer-controlled FM simulcast recording.

㉛ **ON SCREEN button**
The 5-second on-screen display for mode check is automatically available each time the mode is changed or called up manually by pressing the ENTER button ㉟ or this ON SCREEN button. (See page 22.) The on-screen display for timer programming, which is called up by pressing the PROGRAM button ㊱, can be cancelled by pressing the ON SCREEN button. (See page 37.)

㉜ **CLOCK ADJ button**
Press this button for clock setting. (See page 21.)

㉝ **GO-TO button**
Press to engage the counter Go-To mode. (See page 30.)

㉞ **Multi-purpose numeric keys**
Channel selection : Page 15
Clock setting : Page 21
Index Search : Page 28
Counter Go-To : Page 30
Timer programming : Page 36

㉟ **ENTER button**
Press to restore a skipped channel or to tune to the selected channel instantly (see page 16). Also use to call up the mode check display on the TV screen (see page 22) or for timer programming and clock setting.

㊱ **PROGRAM button**
Press this button when you want to preset the timer for unattended recording. (See page 36.)

㊲ **SP/EP select button**
Press to SP position when you wish recordings to be made in the SP (Standard Play) mode. When you wish to record longer TV shows or for unattended and prolonged recording of a number of TV shows with a combined time of up to 8 hours (with a T-160 cassette), press to EP (Extended Play).

㊳ **CANCEL/SKIP button**
Press to skip unnecessary channels. (See page 16.)
In the program set mode, it can function as the CANCEL button. (See page 39.)

㊴ **TIMER button**
Press to engage the Timer Standby mode after you have preset the timer for unattended recording.

㊵ **DISPLAY button**
Press to switch the smaller 4-digit display in the sequence of tape counter to remaining tape time display to date. (See pages 27 and 29.)

㊶ **CHANNEL/CURSOR (NEXT/BACK) buttons**
Press either button to select a desired channel. Can also be used as cursor keys in clock setting and timer programming.

㊷ **COUNTER RESET button**

㊸ **PICTURE SHARPNESS control**
Use this control to make the picture sharper or softer. Effective only for playback pictures. (No effect for recording.)

㊹ **PHONES LEVEL control**
Adjusts the level of the audio output from the headphone jack ⑰.

㊺ **V.LOCK control**
When operating in the Still, Freeze or Strobe mode, turn this control to eliminate vertical vibrations of the picture, if observed.

㊻ **AUDIO MONITOR button**
Press to select the audio output. Each time the button is pressed, the soundtrack to be output changes (Hi-Fi stereo, normal, or mixed playback) and is indicated by the Hi-Fi and NORMAL indicators ⑮.

㊼ **S-VHS mode select button**
This button switches between S-VHS and VHS recording modes. When the S-VHS mode is selected, the S-VHS indicator ⑥ illuminates. S-VHS recordings are possible only when S-VHS cassettes are used in the S-VHS recording mode.

(48) **EDIT switch**
Normally set to OFF. For making multi-generation dubs, set it to the ON position. (See page 42.)

(49) **COUNTER MEMORY switch**
When this switch is set to ON, the tape will stop automatically at the counter reading of about "0000" in the Rewind or Fast Forward mode.

(50) **SOURCE SELECT switch**
For selecting the recording input signal.

TUNER:	To record signals coming from the built-in tuner.
SIMUL:	To record the video signal and normal audio signal from the built-in tuner and the hi-fi audio signal from the rear panel AUDIO IN connectors. When recording FM simulcast TV programs, use this position.
AUX:	To record signals coming from a unit connected to the VIDEO IN and AUDIO IN connectors.

(51) **LEVEL INDICATOR switch**
Selects the function of the audio level/hi-fi tracking meter on the FDP.

ON:	To obtain the indication of audio level.
OFF:	To turn the meter off.
Hi-Fi TRACK:	To use the meter for hi-fi tracking adjustment.

(52) **VIDEO IN SELECT switch**
When the SOURCE SELECT switch (50) is set to AUX, set this VIDEO IN SELECT switch according to the source connection.

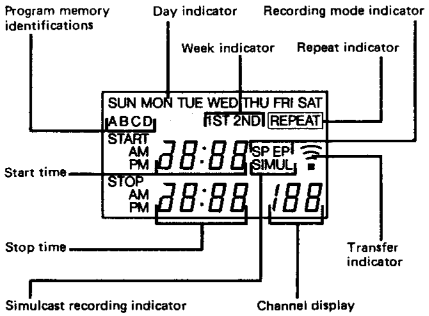
VIDEO:	Set to this position when recording a source connected to the VIDEO IN connector.
S:	Set to this position when recording a source connected to the S-VIDEO IN connector (79) (which accepts separated luminance and chrominance signals).

(53) **ALC switch**
Set to ON to activate the automatic level control circuit for Hi-Fi audio. For manual control of the hi-fi audio recording level, set this switch to OFF and use the Hi-Fi AUDIO REC LEVEL controls (29) for adjustment.

Remote Control Unit

The infrared remote control unit gives you full operation control from your viewing position. All control buttons, except those separately explained, have the same function as the corresponding buttons on the recorder. However, in the case of the REC button, to start recording, both the REC and PLAY/x2 buttons must be pressed simultaneously. The maximum operating distance is about 8 m (26 ft).

(54) **LCD (Liquid Crystal Display) panel**
Refer to this panel when programming the remote control's built-in timer memory.



(55) **MEMORY PROG. button**
Press to program the remote control's timer memory.

(56) **MEMORY CANCEL button**
Press to cancel the programmed data in the remote control's timer memory.

(57) **MEMORY TRANS button**
Press to transfer the data held in the memory to the recorder.

(58) **CURSOR (BACK/NEXT) buttons**
Use these buttons to advance the cursor or move it back to a previous position during timer programming.

(59) **INTRO button**
Press to engage the Intro Search mode. See pages 29 and 35.

(60) **SKIP SEARCH button**
In the Play mode, press once to zip (advance rapidly) through the following 30 seconds of tape. This button may be pressed up to four times to zip through 2 min. of tape. Press PLAY to cancel the Skip Search mode. (See page 23.)

(61) **VCR VOL. (+/-) buttons**
Press these buttons to adjust volume of an audio amp or TV connected to the rear panel VARIABLE AUDIO OUT connectors (76).

(62) **VCR CH (∨/∧) buttons**
Press either button to select desired channels received by the VCR's built-in tuner.

(63) **TV CH ∨/∧ buttons**
Press to scan to a desired channel on the TV receiver.

(64) **TV VOL. (-/+) buttons**
Press "-" or "+" to decrease or increase the TV's sound volume.

(65) **TV/VIDEO MONITOR button**
Press to select TV's Video mode or TV mode. (Designated TV models only.)

(66) **POWER (TV) button**
Press to turn the TV power on or off. (Designated TV models only.)

(67) **SWAP button**
While in the Picture-In-Picture mode, press to switch the pictures between the main screen and window.

(68) **TWIN PICTURE button**
During tape playback, press to display a TV broadcast program in an insert window (Picture-In-Picture mode). Additional pressing of this button shifts the position of the window.

(69) **ZOOM UP button**
Press to zoom up the desired quarter of the picture to fill the screen. (See page 33.)

(70) **ART button**
Press to select the desired digital art effects; two different solarization effects and two different mosaic patterns are available in sequence. (See page 33.)

(71) **DIGITAL MEMORY button**
Press to engage the digital memory for a variety of digital functions. See pages 31 to 35.

(72) **MULTI SCREEN button**
Press to select the desired number of sub-screens (4, 9 or 16) for a variety of multi-screen functions. See pages 31 to 35.

(73) **STROBE SPEED button**
Press to select the desired strobe speed in the Strobe or Multi-Screen Strobe mode. See page 32.

(74) **OFF button**
Press to disengage any digital function and restore normal pictures. See pages 31 to 35.

Remote Control Unit

A/B mode switching
A switch on the back of the remote control labelled A/B is accessible when the battery compartment cover is removed.

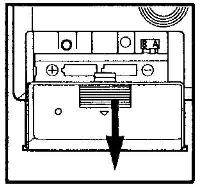
- This switch is preset to the "A" position. Do not touch it unless you use two JVC video decks side by side.
- When you place two JVC video decks near each other, use this remote control in the "B" mode to prevent both decks from responding simultaneously to this remote control's signals. For this purpose, carefully follow the instructions below:

(1) Unplug the power cord of the HR-S8000U from the AC outlet.
(2) Set the remote control unit's A/B mode switch to "B".
(3) Plug the power cord of the HR-S8000U into the AC outlet.
(4) Turn on the power of the HR-S8000U using the remote control's VIDEO POWER button.
- The HR-S8000U "memorizes" this B code and then will respond only to the signals of this remote control unit. The other deck will respond only to its remote control.

Note:
Do not operate other remote controls after you have plugged the HR-S8000U into the AC outlet and before you press the VIDEO POWER button of this remote control.

CAUTION: Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".

Installing the batteries



1. Slide the battery compartment cover on the rear of the unit in the direction of the arrow (▶).
2. Insert 2 "AA"-size batteries (provided) in the correct directions into the battery compartment.
3. Replace the cover.

Rear Panel

(75) **AC OUTLET**
Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 300 watts of power. The power flow through this outlet is controlled by the AC ONLINE switch (22).

(76) **VARIABLE AUDIO OUT terminals**
Connect to the AUDIO IN terminals of another video recorder for tape-to-tape transfer, or the AUDIO IN terminals of a television or video monitor for playback. Convenient for connecting a non-JVC-brand TV in order to control that TV's volume with the VCR VOL. (+/-) buttons (61) on the remote control unit.

(77) **AUDIO IN terminals**
Connect to the AUDIO OUT terminals of another video recorder for tape-to-tape transfer, or the AUDIO OUT terminals of the camera adapter for camera recording.

(78) **VIDEO IN terminal**
Connect to the VIDEO OUT terminal of another video recorder for tape-to-tape transfer, or the VIDEO OUT terminal of the camera adapter for camera recording.

(79) **S-VIDEO IN connector**
This is a special connector (4-pin) to accept separated luminance and chrominance signals. To record this type of vodeo signal, connect an appropriate source to this terminal using the provided video cable. Use the AUDIO IN connectors for making audio signal connections. When recording from this connector, set the VIDEO IN SELECT switch (52) to S.

(80) **S-VIDEO OUT terminal**
This is a special connector (4-pin) to deliver separated luminance and chrominance signals. For tape-to-tape transfer of S-VHS recordings, connect this terminal to the S-VIDEO IN terminal of a 2nd S-VHS video recorder using the provided video cable. Or connect to the same type of connector of a television or monitor equipped with an S-VIDEO input terminal. In these cases, use the AUDIO OUT terminals (76) or (85) for making audio connections.

(81) **ANT IN terminal**
Connect the antenna cable or a Cable TV Line. If necessary, use the matching transformer (provided).

(82) **RF output channel select switch**
See "VIDEO CHANNEL SETTING" on page 14.

(83) **RF OUT terminal**
Connect to the all-channel antenna connector (female F) of a TV receiver using the antenna cable (provided). If your TV receiver has separate VHF/UHF 300-ohm antenna terminals only, use the antenna splitter (provided) to connect the antenna cable to these terminals.

(84) **VIDEO OUT terminal**
Connect to the VIDEO IN terminal of another video recorder for tape-to-tape transfer, or the VIDEO IN terminal of a video monitor for playback.

(85) **AUDIO OUT terminals**
Connect to the AUDIO IN terminals of another video recorder for tape-to-tape transfer, or the AUDIO IN terminals of a video monitor for playback.

(86) **REMOTE PAUSE terminal**
When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch.

(87) **AC power cord**
Connect to an AC 120 V∿, 60 Hz household outlet.

FOR A BETTER UNDERSTANDING OF S-VHS AND VHS

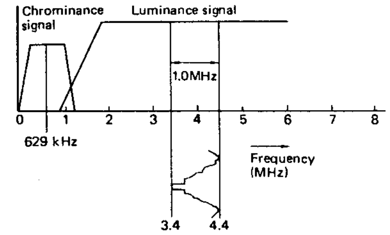
S-VHS vs. VHS

- VHS is the world's most popular video format. If you owned a VCR before the HR-S8000U, most likely it was a VHS machine.
- **S-VHS is a new video sub-format based on VHS. It offers superior picture quality with a horizontal resolution of more than 400 lines by shifting the FM carrier frequency of the luminance signal from the conventional 3.4 – 4.4 MHz range to a higher one of 5.4 – 7 MHz.**

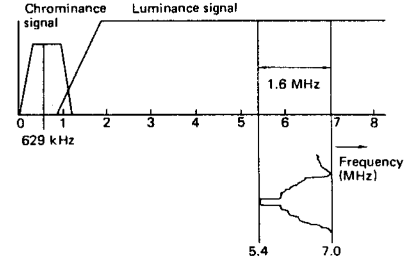
- The HR-S8000U is equipped for recording and playback in both the S-VHS and VHS formats. Therefore, you can still play back your VHS software programs and previously recorded family recordings.
- You can switch to the world of S-VHS for your new recordings to enjoy breath-taking picture quality. Or to exchange recordings with someone whose VCR is not S-VHS, simply record in the VHS mode, whether with a regular VHS cassette or an S-VHS cassette.

Recording Signal Spectrum

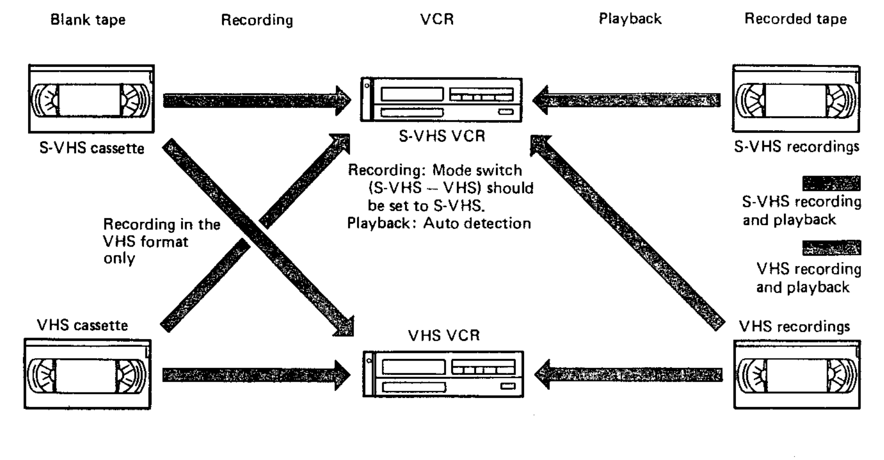
Video head output signal of VHS recording



Video head output signal of S-VHS recording

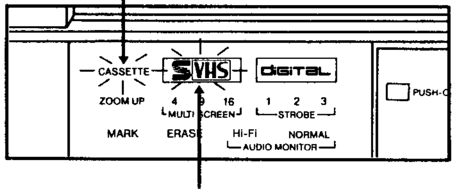


Compatibility between S-VHS and VHS

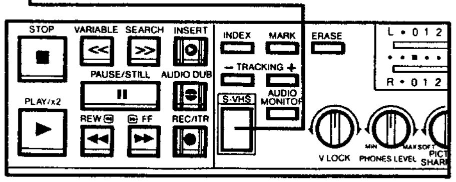

Blank tape
Recording
VCR
Playback
Recorded tape
S-VHS cassette
S-VHS VCR
S-VHS recordings
Recording: Mode switch (S-VHS – VHS) should be set to S-VHS.
Playback: Auto detection
Recording in the VHS format only
S-VHS recording and playback
VHS recording and playback
VHS cassette
VHS VCR
VHS recordings

S-VHS Recording

Insert an S-VHS cassette: this indicator will light.

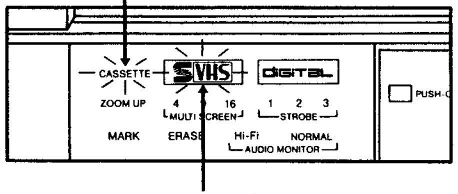

CASSETTE
S-VHS
DIGITAL
ZOOM UP
4
16
1
2
3
MULTI SCREEN
STROBE
MARK
ERASE
Hi-Fi
NORMAL
AUDIO MONITOR
PUSH-

Press the S-VHS button: this indicator will light.


STOP
VARIABLE SEARCH
INSERT
INDEX
MARK
ERASE
PAUSE/STILL
AUDIO DUB
– TRACKING +
PLAY/×2
S-VHS
AUDIO MONITOR
REW
FF
REC/ITR
L 0 1 2
R 0 1 2
V LOCK
PHONES LEVEL
MIN
MAX
SOFT
PICT
SHARP

S-VHS Playback

Simply insert a recorded S-VHS cassette: this indicator will light.


CASSETTE
S-VHS
DIGITAL
ZOOM UP
4
16
1
2
3
MULTI SCREEN
STROBE
MARK
ERASE
Hi-Fi
NORMAL
AUDIO MONITOR
PUSH-

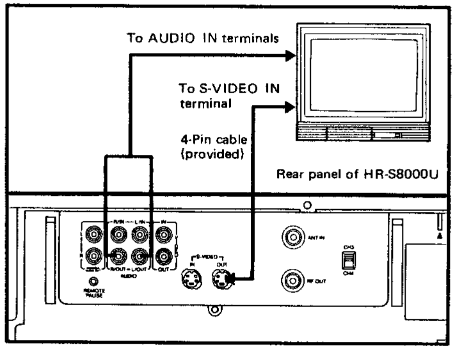
When playback starts, this indicator will light automatically.

How to take best advantage of S-VHS pictures

For flexibility, the HR-S8000U offers two sets of video input/output terminals: one for the regular composite video signal in which the luminance (Y) and chrominance (C) signals are mixed together, and the other for the separated Y/C signals.
No special connections are necessary to record and play back broadcast programs. Simply follow the connecting instructions on the next page.

Using a television with S-VIDEO input

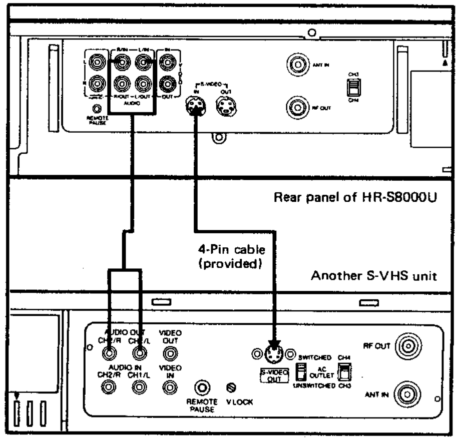
If your television is equipped with an S-VIDEO input (separated Y/C signals) terminal, this is an ideal way to enjoy the best possible S-VHS picture, because no interference occurs between the luminance and chrominance signals.
Connect the S-VIDEO OUT terminal of the HR-S8000U to the S-VIDEO IN terminal of your television. To view video cassettes with this setup, set the TV to the VIDEO mode. (It is not necessary to set the TV to channel 3 or 4.)
With JVC's AV televisions, switching to the VIDEO mode can be performed on the HR-S8000U's remote control (MONITOR TV/VIDEO button).


To AUDIO IN terminals
To S-VIDEO IN terminal
4-Pin cable (provided)
Rear panel of HR-S8000U
REMOTE PAUSE
S-VIDEO IN OUT
ANT IN
RF OUT
CH3
CH4

Recording from other S-VHS equipment

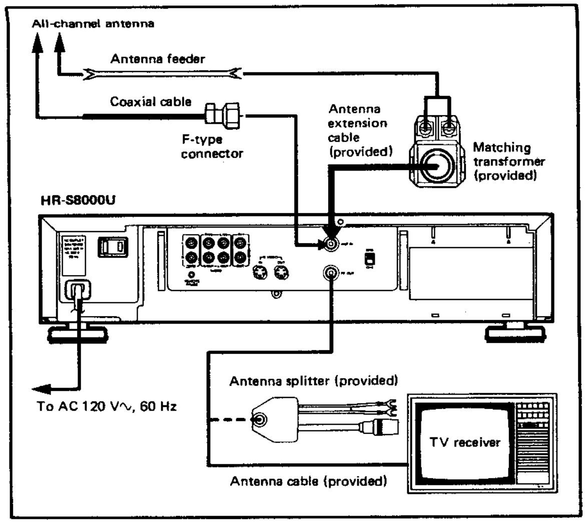
For recording sources which deliver separated Y/C signals, use the S-VIDEO IN connector and proceed as follows:

1. Insert an S-VHS cassette.
2. Switch to the S-VHS mode.
3. Set the SOURCE SELECT switch to AUX.
4. Set the VIDEO IN SELECT switch to S.


Rear panel of HR-S8000U
4-Pin cable (provided)
Another S-VHS unit
AUDIO OUT CH2/R CH1/L
VIDEO OUT
AUDIO IN CH2/R CH1/L
VIDEO IN
REMOTE PAUSE
V LOCK
S-VIDEO OUT
SWITCHED CH4
AC OUTLET
UNSWITCHED CH3
RF OUT
ANT IN

CONNECTIONS

TO VHF AND UHF ANTENNAS


All-channel antenna
Antenna feeder
Coaxial cable
F-type connector
Antenna extension cable (provided)
Matching transformer (provided)
HR-S8000U
To AC 120 V∿, 60 Hz
Antenna splitter (provided)
TV receiver
Antenna cable (provided)

Procedure

- Remove the antenna cable from the TV receiver and reconnect to the HR-S8000U's ANT IN connector as illustrated. The HR-S8000U is then ready to record off-air programs.

Notes:

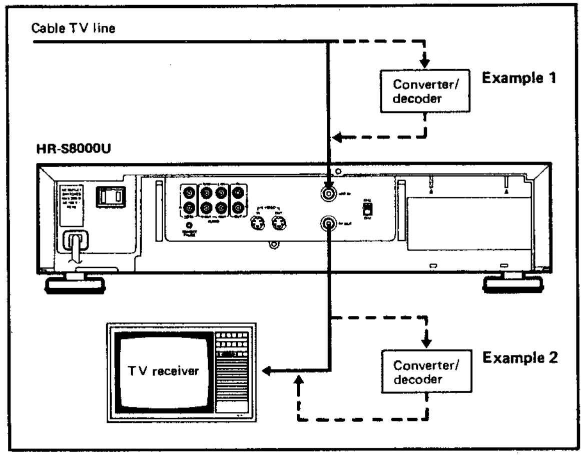
- If your antenna cable is a 300-ohm flat feeder, use the provided matching transformer.
- If your antenna system has separate VHF/UHF lead-in wires, use an antenna mixer and connect its output to the HR-S8000U's ANT IN connector, either directly or through the provided matching transformer depending on the type of the mixer.

- Connect the HR-S8000U to the TV receiver using the 75-ohm antenna cable (provided).

Note: If your TV is equipped with 300-ohm UHF input terminals and a 75-ohm VHF input terminal, use the antenna splitter (provided) to complete connection.

As this unit uses the latest digital technology, some care should be taken in connecting the antenna cable. If TV picture interference or distortion occurs, first check whether the proper connections have been made. If there is no improvement, proceed to connect the **provided antenna extension cable** between the matching transformer and the HR-S8000U, and place the matching transformer away from the unit so that the picture clears.

TO CABLE TV LINE


Cable TV line
Converter/ decoder
Example 1
HR-S8000U
TV receiver
Converter/ decoder
Example 2

Note:
If your cable TV system does not require a converter/decoder for scrambled signals, you can use the cable-compatible tuner built into the HR-S8000U for viewing and recording. In this case, simply connect the cable TV line to the ANT IN terminal of the recorder and the RF OUT terminal of the recorder to your TV receiver. Please contact your cable TV company for any questions concerning hookups or cable TV operation.

Example 1

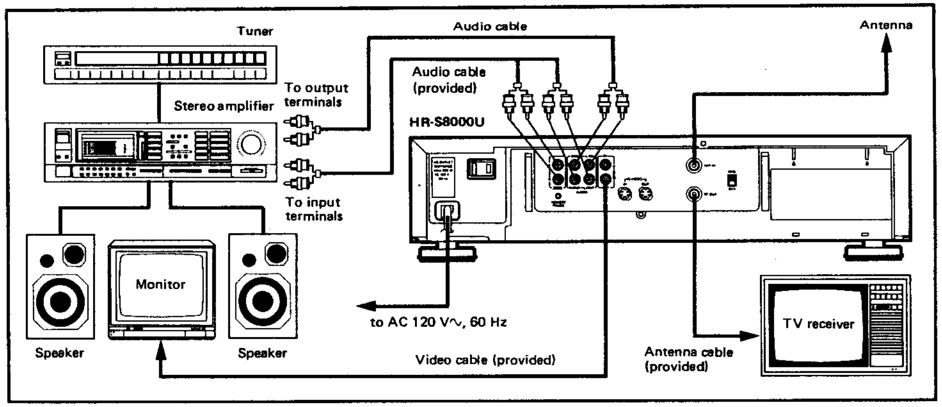
- You can record any scrambled cable TV channel while watching it.
- Select the recording channel on the converter/decoder.
- Set the recorder to the output channel of the converter/decoder (channel 3 or 4).
- Set the TV receiver to channel 3 or 4.
- Set the TV/VIDEO button on the recorder to VIDEO (the VIDEO indicator on the FDP lights).

Example 2

- You can record any non-scrambled cable TV channel while watching it or any other channel including "scrambled signal" channels.

  Note: "Scrambled signal" channels cannot be recorded.
- Select the recording channel on the recorder.
- Select the viewing channel on the converter/decoder.
- Set the TV receiver to the output channel of the converter/decoder (channel 3 or 4).
- Set the TV/VIDEO button as necessary.

TO A STEREO SYSTEM


Tuner
Audio cable
Antenna
Stereo amplifier
To output terminals
Audio cable (provided)
HR-S8000U
To input terminals
Monitor
Speaker
Speaker
to AC 120 V∿, 60 Hz
Video cable (provided)
Antenna cable (provided)
TV receiver

Procedure

- Connect the AUDIO IN L and R connectors of the HR-S8000U to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)
- Connect the AUDIO OUT or VARIABLE AUDIO OUT connectors of the HR-S8000U to the AUX IN or TAPE MONITOR terminals of the amplifier.

Application

- With this setup, you can enjoy prerecorded Hi-Fi VHS tapes in stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programs with hi-fi audio accompaniment. See page 40.
- You can also record only audio (without recording any video signal) on both hi-fi and longitudinal audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160 cassette). See page 40.
- If you want to timer-control the recording of FM simulcast programs, connect the tuner's power cord to the HR-S8000U's AC outlet. Set the AC ONLINE switch to ON, and both the tuner and the HR-S8000U will be switched on at a time preprogrammed by the HR-S8000U. Timer-controlled recording of FM simulcast programs is not possible with the type of tuners which reset the channel each time the power is switched off.

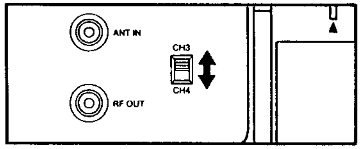
CAUTION:

- The HR-S8000U has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

VIDEO CHANNEL SETTING

The built-in RF converter permits playback of video and audio recordings through a TV receiver.
The signals from the RF converter are viewed through a vacant channel not used for broadcasting in your viewing area.

(Rear)


ANT IN
CH3
CH4
RF OUT

The converter channel of all units is set to 3 prior to shipment from the plant. Reset the channel to 4 in areas where channel 3 is employed for broadcasting.

For this purpose, slide the channel select switch on the rear of the unit to CH 4.

This is YOUR video channel. To view video cassettes, always set the TV channel selector to either channel 3 or 4.

OPERATING THE BUILT-IN TUNER

The HR-S8000U incorporates an advanced frequency synthesized tuner which is pretuned to VHF channels 2 through 13, UHF channels 14 through 69 and 113 (excluding 12 VHF broadcasts) cable TV channels* (including mid, super, hyper and ultra bands). There is no need to preset the tuner; it automatically receives the broadcast corresponding to the channel number displayed.

*In Canada: 110 (excluding 12 VHF broadcasts) cable TV channel capability.

Note: If the picture is not clear, perform fine tuning on your television.

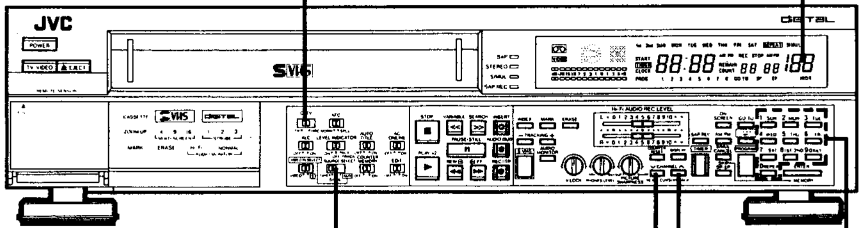
Stored and skipped channels

A total of 181 channels are receivable. However, to prevent the tuner from scanning all the frequencies to reach your desired station, some channels are skipped. It is possible to restore the skipped channels whenever necessary. Also, it is possible to skip more channels if there are no broadcasts on those channels in your area.

Prior to shipment, the following channels are stored for instant tuning.

BAND switch setting	Channels	
CATV	VHF CATV	2 through 13 14, 18, 23, 29, 36, 48, 49
TV	VHF UHF	2 through 13 14, 15, 17, 18, 20, 22, 23, 25, 27, 29, 30, 32, 35, 36, 40, 44, 48, 49

Band select switch
TV: To receive VHF/UHF channels
CATV: To receive cable TV channels
HRC: To receive HRC cable channels



Channel display

Set to TUNER.

Scanning channels

Channels can be "called up" in ascending or descending order by using the CHANNEL∨/∧buttons on the front control panel. To scan channel numbers which are higher than the channel being received, press and hold the CHANNEL "∧" button. Release when the desired channel is reached. Press and hold the CHANNEL "∨" button to scan lower numbered channels. Release when the desired channel is reached.

Selecting channels

1 To select a channel, simply press the numeric keys. The channel number selected will appear on the display; the channel will change automatically within 2 to 3 seconds after the last numeric key is pressed.

2 To change channels immediately, press the ENTER button after pressing the numeric keys.

Note:

- If an invalid channel is entered, the entered data is cleared and the display returns to the previous number.

Programming favorite channels

Skipping unused channels makes it possible to scan only those channels which are active in your area.

Skipping channels

1 Select the channel you want to skip with numeric keys or up/down tuning.

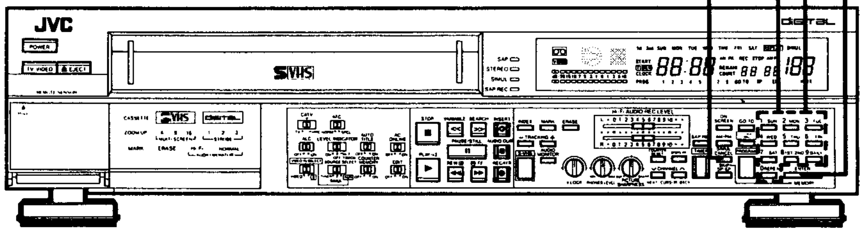
2 Press CANCEL/SKIP.
- The letters "PO" will appear momentarily in place of the channel number, indicating that the corresponding channel has been skipped.
- The channel is now eliminated from the up/down scanning sequence. Repeat for each channel you want to skip.

Storing channels

1 Press the numeric keys to select the channel you want to re-enter.

2 Press ENTER within 2 seconds.
- The channel "entered" will now be available when the channel scanning sequence is used.

Note:
If the recorder is unplugged from the AC outlet, or there has been a power interruption, favorite channel programming will be maintained. There is no need to re-program channels.



Cable (CATV) Channel Reference Chart

The Cable TV (CATV) Channel Reference Chart is supplied for your convenience. Fill in the name or number of the actual station being provided by your CATV company on each CATV channel. (Your CATV company should give you this information.)
If the TV tuner is NOT connected to a CATV antenna system, it is important that the Band Select switch be in the TV position to properly receive VHF channels 2 through 13 and UHF channels 14 through 69.
Note: CATV channels A-1, A-2 & A-8 are not available in Canada.

CATV channel	2	3	4	4a (A-8)	5 (A-7)	6 (A-6)	A-5	A-4	A-3	A-2	A-1	A	B	C	D	E	F	G
Channel number indication	2	3	4	1	5	6	95	96	97	98	99	14	15	16	17	18	19	20
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV channel	H	I	7	8	9	10	11	12	13	J	K	L	M	N	O	P	Q	R
Channel number indication	21	22	7	8	9	10	11	12	13	23	24	25	26	27	28	29	30	31
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV channel	S	T	U	V	W	W+1 (AA)	W+2 (BB)	W+3 (CC)	W+4 (DD)	W+5 (EE)	W+6 (FF)	W+7 (GG)	W+8 (HH)	W+9 (II)	W+10 (JJ)	W+11 (KK)	W+12 (LL)	W+13 (MM)
Channel number indication	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV channel	W+14 (NN)	W+15 (OO)	W+16 (PP)	W+17 (QQ)	W+18 (RR)	W+19 (SS)	W+20 (TT)	W+21 (UU)	W+22 (VV)	W+23 (WW)	W+24 (XX)	W+25 (YY)	W+26 (ZZ)	W+27 (AAA)	W+28 (BBB)	W+29	W+30	W+31
Channel number indication	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV channel	W+32	W+33	W+34	W+35	W+36	W+37	W+38	W+39	W+40	W+41	W+42	W+43	W+44	W+45	W+46	W+47	W+48	W+49
Channel number indication	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV Channel	W+50	W+51	W+52	W+53	W+54	W+55	W+56	W+57	W+58	W+59	W+60	W+61	W+62	W+63	W+64	W+65	W+66	W+67
Channel number indication	86	87	88	89	90	91	92	93	94	100	101	102	103	104	105	106	107	108
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
CATV channel	W+68	W+69	W+70	W+71	W+72	W+73	W+74	W+75	W+76	W+77	W+78	W+79	W+80	W+81	W+82	W+83	W+84	
Channel number indication	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	
Actual TV station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

INFORMATION ON THE HR-S8000U'S AUDIO SYSTEM

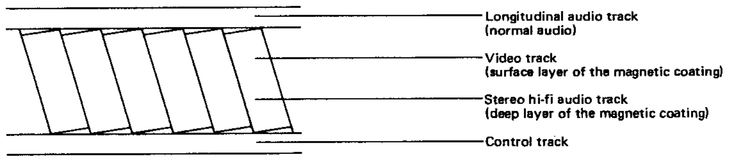
Hi-Fi and normal audio

To provide true hi-fi audio accompaniment to video entertainment and, at the same time, compatibility with regular VHS tapes, the HR-S8000U employs a unique audio recording system. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating, and the video signal is recorded on top of the audio signals in a shallower layer. At the same time, another audio head records normal audio signals (monaural) onto the usual longitudinal audio track. Since this longitudinal audio track is exactly the same as on regular VHS tapes, tapes recorded on the HR-S8000U can be played back on other VHS machines, and vice versa.

CAUTION:

- The hi-fi soundtrack recorded with the HR-S8000U cannot be reproduced with video equipment other than Hi-Fi VHS.
- Tapes recorded with a conventional stereo video recorder produce monaural sound when played back with the HR-S8000U.

Tape pattern recorded with the HR-S8000U



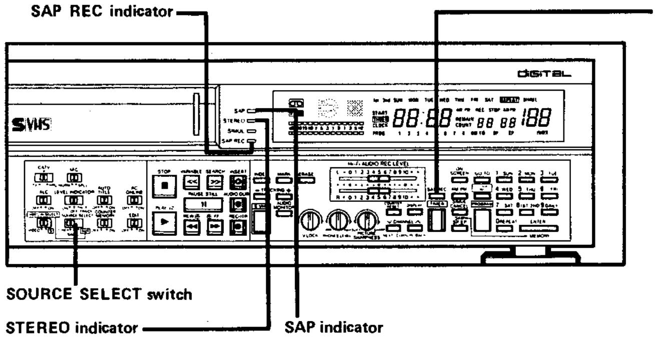
Hi-fi audio recording and reproduction are available only from the hi-fi audio track while the longitudinal audio track provides normal audio.

The hi-fi and normal soundtracks are recorded simultaneously, and audio dubbing is applicable only to the normal audio.

MTS (Multichannel Television Sound) compatibility

When stereo and SAP programs are being received, the indicators light to inform you of the type of broadcasts. Then you can select the desired soundtrack for recording with a single switch.

The normal (longitudinal) audio track is monaural. Therefore, stereo programs are recorded in mono on the normal audio track. SAP programs can only be recorded on the normal audio track.



SAP REC button

This button selects the soundtrack to be recorded on the normal audio track when an MTS broadcast is being received and functions only when the SOURCE SELECT switch is set to either TUNER or SIMUL.

- Press to record an SAP soundtrack on the normal audio track. (The main soundtrack, either mono or stereo, will be recorded on the hi-fi audio track.)
- Release to record a main soundtrack on the normal audio track. Stereo programs will be recorded in mono (L + R mixed) on the normal audio track (and in stereo on the hi-fi audio track).

STEREO indicator

Lights when a stereo program is being received. Stereo programs are always recorded in stereo on the hi-fi audio track.

SAP indicator

Lights when an SAP program is being received. For recording the SAP soundtrack, press the SAP REC button. The SAP REC indicator will light.

If the STEREO and SAP indicators light, it means that a stereo + SAP program is being received. If you want to record both soundtracks, press the SAP REC button. (The SAP REC indicator will light). Then the stereo soundtrack will be recorded on the hi-fi audio track and the SAP soundtrack will be recorded on the normal audio track.

Note:

- Off-air MTS programs are received in accordance with the Broadcast Television Systems Committee (BTSC) standard. The method of transmission of stereo programs via cable varies from area to area and may not be compatible with the BTSC standard. Consult your local cable company for compatibility in your area.

Recording options according to the settings of the SOURCE SELECT switch

SOURCE SELECT switch position / Track	Video track	Normal audio track (mono)	Hi-fi audio track (2-channel)
TUNER (SOURCE SELECT: TUNER • SIMUL • AUX)	TV picture (from built-in tuner)	TV sound (from built-in tuner) (Mixing with microphone input is possible.)	
SIMUL (SOURCE SELECT: TUNER • SIMUL • AUX)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO IN (Mixing with microphone input is possible)
AUX (SOURCE SELECT: TUNER • SIMUL • AUX)	Video signal from VIDEO IN or S-VIDEO IN (depending on the setting of VIDEO IN SELECT switch)	Audio signal from AUDIO IN (Mixing with microphone input is possible.)	

Note:

- You can record audio only (without recording any video signal) on the normal and hi-fi audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160). For this purpose, set the SOURCE SELECT switch to AUX and connect an audio source, such as an FM tuner, to the AUDIO IN connectors. Nothing should be connected to the VIDEO IN connector.

Recording options according to the type of broadcasts and the setting of the SAP REC button (indicated by the SAP REC indicator)

Type of broadcast	SAP REC button and SAP REC indicator / Audio track	Normal audio track (mono)	Hi-fi audio track (2-channel) L	Hi-fi audio track (2-channel) R
Regular broadcast (monaural audio)	Either position	Mono	Mono	Mono
Regular + SAP (Second audio program)	Released (SAP REC ▭, SAP REC ▭)	Main audio	Main audio (mono)	Main audio (mono)
	Pressed in (SAP REC ▬, SAP REC ☀)	Second audio	Main audio (mono)	Main audio (mono)
Stereo + SAP (Second audio program)	Released	L + R mixed	Stereo	
	Pressed in	Second audio	Stereo	
Stereo broadcast	Either position	L + R mixed	Stereo	

Note:

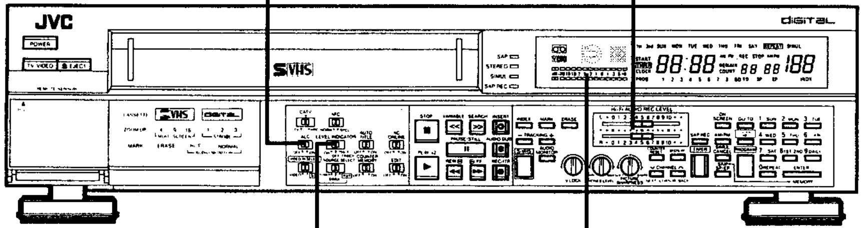
- Second audio programs cannot be recorded on the hi-fi audio track.

Hi-Fi audio recording level adjustment

While recording onto the normal audio track is controlled by the built-in Automatic Level Control (ALC) circuit, hi-fi audio recording has two control options: manual and automatic.

ALC switch
Setting this switch to ON activates the built-in audio limiter circuit for both channels so that the recording level is automatically controlled. For manual adjustment, set this switch to OFF. (The recording level for normal audio is always controlled automatically regardless of the setting of the switch.)

Hi-Fi AUDIO REC LEVEL controls
Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the hi-fi audio recording level.



LEVEL INDICATOR switch
For manual control of the recording level, set this switch to ON so that the audio level indicators on the FDP will light.

Audio level indicators
For manual control of the recording level, first set the relevant switches as follows:

ALC → OFF
LEVEL INDICATOR → ON
AUDIO MONITOR → Hi-Fi

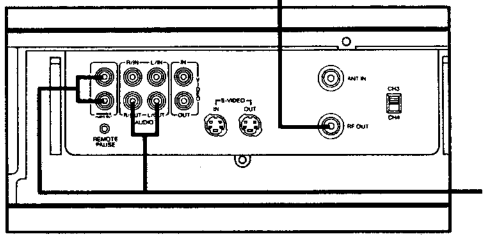
Then slide the Hi-Fi AUDIO REC LEVEL controls referring to these indicators. When indicators up to or near 0 dB light for the loudest signal being received, the recording level is optimum. (The level at which only one red indicator lights from time to time may be most appropriate.)
During playback, these indicators show the level of audio signals recorded on the tape and selected with the AUDIO MONITOR button.
If no signal is recorded on the hi-fi audio track, the level of normal audio is automatically indicated.
These indicators do not light when the LEVEL INDICATOR switch is in the OFF position.

Notes

- With the AUDIO MONITOR select button in the NORMAL position, the recording level of hi-fi audio signals cannot be correctly indicated. Select the Hi-Fi position when adjusting the recording level.
- The normal audio signal level is also displayed by these indicators, but cannot be adjusted.

Dual-audio playback flexibility

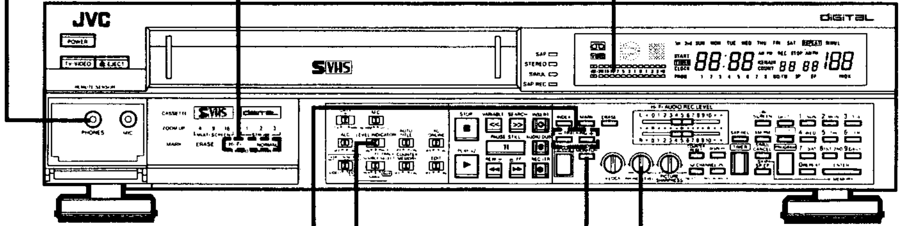
Two different types of audio tracks (hi-fi and normal) allow a variety of playback options depending on the connection and the settings of relevant controls and switches.



RF OUT connector
Delivers audio and video signals to a TV receiver. When the recorder is not used, the antenna signal is supplied from this connector to the TV receiver to allow regular TV viewing. When a video tape is played back through the RF OUT connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed or the one selected by the AUDIO MONITOR button is reproduced. Therefore, for stereo playback, connect a stereo system to the VARIABLE AUDIO OUT or AUDIO OUT connectors. Refer to page 14.

VARIABLE AUDIO OUT and AUDIO OUT connectors
Deliver the audio signals from both hi-fi and normal audio tracks.

PHONES jack
Delivers the audio signals from both hi-fi and normal audio tracks. The headphone output level is adjustable with the PHONES LEVEL control.


Audio select indicators (Hi-Fi/NORMAL)
Audio level/Hi-Fi tracking meter
PHONES LEVEL control

LEVEL INDICATOR switch and TRACKING controls
The audio level indicators on the FDP show the audio signal level during recording and playback when the LEVEL INDICATOR switch is set to ON.
The right-channel audio level indicator also functions as a tracking meter during playback. If noise or breaks are sensed in the reproduced sound from the hi-fi audio track, attempt correction by using the TRACKING controls while referring to the meter. For this purpose, set the LEVEL INDICATOR switch to Hi-Fi TRACK and press either TRACKING control button so that the greatest number of elements of the right-channel indicator light.
When this switch is set to OFF, the indicators do not light; regardless of whether during recording or playback.

Note:

- When playing back a tape with no recording on the hi-fi audio track, the level indicator does not light when the LEVEL INDICATOR switch is set to Hi-Fi TRACK.

AUDIO MONITOR button
Selects the hi-fi stereo soundtrack, the normal soundtrack, or a mixture of the two for listening. Each time the button is pressed, the selected soundtrack changes in the order of hi-fi stereo, normal, mixed, and then back to hi-fi stereo and the corresponding audio select indicator will light. For mixed playback, both the Hi-Fi and NORMAL indicators will light.

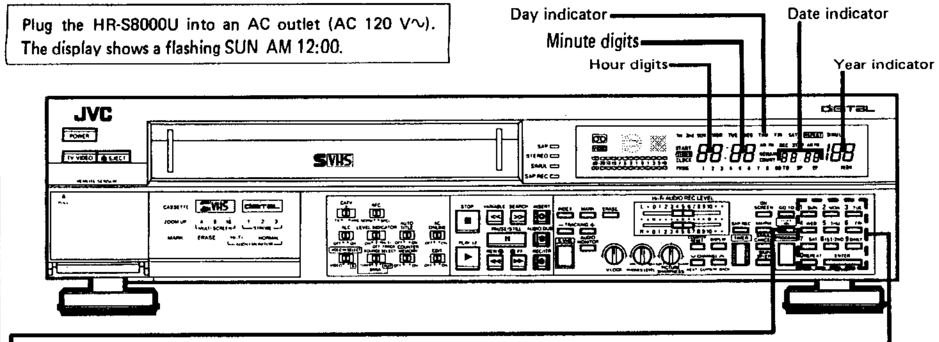
- Set to Hi-Fi to listen to a stereo soundtrack.
- Set to NORMAL to listen to the normal sound.
- Set to Hi-Fi/NORMAL to listen to both.

Notes:

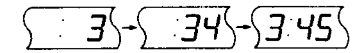
- This button functions during recording as well, although it has no effect on the recorded signal.
- When a tape with normal audio only is played back, the NORMAL mode is automatically selected.

CLOCK SETTING

Plug the HR-S8000U into an AC outlet (AC 120 V∿).
The display shows a flashing SUN AM 12:00.



1. Press CLOCK ADJ.
   The "CLOCK" indication and the indicated day will flash.
2. Press a numeric key corresponding to the day of the week.
   - If the indicated day is OK, proceed to the next step.
3. Press ENTER. The time display section will flash.
4. Press AM/PM to obtain correct indication.
   - If the indicated sign is OK, proceed to the next step.
5. Key in the number corresponding to the time to be set.
   - Example: To set 3:45, press keys 3 4 5 in this order.

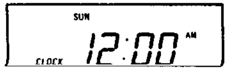


6. Press ENTER.
   - The month display section of the date indicator will flash.
7. Key in the number corresponding to the month to be set.
   Example: To set for December, press keys 1, 2 in succession.
8. Press ENTER.
   - The day display section will flash.
9. Key in the number corresponding to the day.
10. Press ENTER.
    - The year display section will flash.
11. Key in the number corresponding to the year.
    - For 1988, key in only "88".
12. Press CLOCK ADJ at the exact instant of the time signal, and the clock will be set accurately to the present time.

Notes:
- Clock setting must begin within 10 seconds of pressing the CLOCK ADJ button, otherwise it will be necessary to press the CLOCK ADJ button again.
- Clock setting is not possible if the TIMER button is engaged with the TIMER indicator lit. First check to see that the TIMER indicator is not lit.
- Steps 4 and 5 can be reversed.
- The NEXT and BACK keys can be used to switch from the day to time setting mode, or vice versa.
- Auto-titling (see page 25) will not function unless the time, date and year have been correctly set.
- Advance the minute digits slightly ahead of the exact time. Press the CLOCK ADJ button precisely when a time signal from broadcast or telephone is heard to insure accurate time setting.

Power failure indicator

The clock display may reset to SUN AM 12:00 and start to flicker. This is not a malfunctioning of the clock, but it indicates that there has been a power failure in excess of 60 minutes. Readjusting the time restores the normal condition of the clock display.



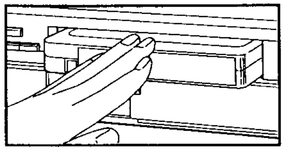
- If the period of power outage is within about 60 minutes, correct time-keeping continues when power is reapplied.
- During this 60-minute period, the built-in memory back-up capacitor maintains time-keeping and preset timer memory, though the display blacks out.
- The memory backup capacitor is being recharged when the recorder is not in use. For the fully-discharged capacitor to be recharged sufficiently for 60-minute backup, it takes more than 30 minutes.

LOADING AND UNLOADING A CASSETTE

Loading

Insert a cassette as illustrated with its labelled side facing you.

- With a cassette inserted, the ▭ mark to indicate "cassette inserted" appears on the display panel. If you insert an S-VHS cassette, the S-VHS CASSETTE indicator will also light.



Unloading

Press the EJECT button. The cassette will be ejected.

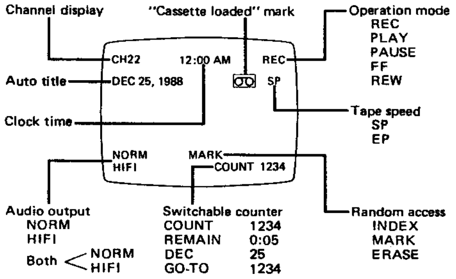
Motorized loading system
- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

Notes:
- Be sure to insert the cassette firmly into the slot; otherwise, it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

Caution
- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

Warning
- Do not insert fingers or any foreign object beyond the door flaps of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

ON-SCREEN CHANNEL, TIME AND MODE DISPLAY



Automatic indication
- Channel
  Each time a different channel is selected, the number of that tuned-in channel is displayed on the TV screen for 5 seconds.
- Operation mode
  Each time the operation mode is changed, that engaged mode is displayed.

REC:	Displayed for 5 seconds together with channel, "cassette loaded" mark, and the tape speed (SP or EP).
PLAY:	Displayed only when the mode is changed from Stop to Play. (No indication appears when special effects are applied in the Play mode.)
PAUSE:	Remains displayed as long as the Record-Pause mode continues.
FF/REW:	Displayed for 5 seconds.

- "Cassette loaded" mark
  In addition to being displayed together with "REC", the mark is displayed for 5 seconds when a cassette is inserted, and blinks until the cassette is ejected when the EJECT button is pressed.
- Audio output
  When the audio output is changed by pressing the AUDIO MONITOR button, the engaged audio output mode is displayed for 5 seconds except during playback.
- Switchable counter

COUNT/REMAIN/ DATE:	When the counter mode is changed, the same information as on the FDP is displayed for 5 seconds.
GO-TO:	When the Go-To mode is engaged, the same information as on the FDP appears and, upon completion of Go-To search, disappears after showing the last figure for 5 seconds.

- Random access

INDEX:	Displayed when the Index Search mode is engaged. When the search number is specified by the numeric keys, this is also displayed until search spooling is initiated.
MARK:	Displayed when an index code is recorded (whether automatically or manually).
ERASE:	Displayed when the ERASE button is pressed.

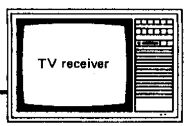
- Auto title
  When the AUTO TITLE switch is set to ON, this date indication together with the time and channel are all displayed and recorded for 5 seconds each time a new recording is started.

Manual recall/cancel
- For anytime checking of the recorder status, or time and date, press the ENTER button (on the recorder or remote control) or the ON SCREEN button (on the remote control). The corresponding indication will be available on the screen for 5 seconds.

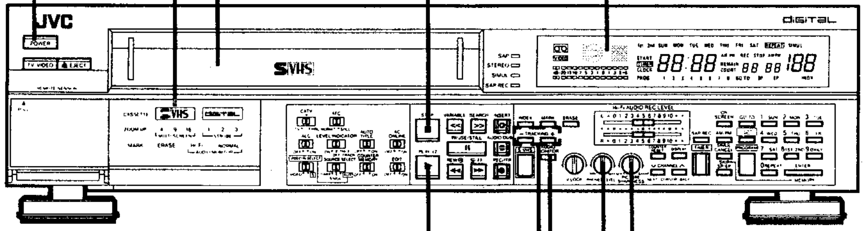
Note:
- For on-screen timer programming, see page 37.

PLAYING BACK A VIDEO CASSETTE

1 Switch ON.
Adjust the TV receiver's channel to the video channel (3 or 4).



2 Load a pre-recorded cassette. Power will be switched on automatically. When the cassette loaded has no safety tab, playback starts automatically.



5 Press STOP at the end of the program.

Mode indicator

PLAY: ▷

4 Press PLAY/X2.

3 Set the AUDIO MONITOR button as required. See page 20.

Skip Search function
During playback, press the remote control's SKIP SEARCH button from 1 to 4 times to zip through 30-sec. to 2-min. sections of tape. Press the PLAY/X2 button to cancel the Skip Search mode.

Notes:

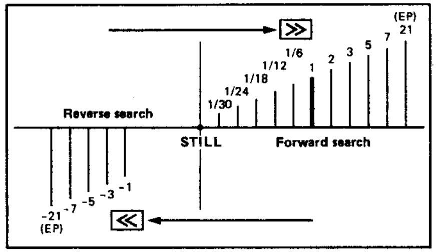
- The SP/EP button may be in either position.
  The SP, LP or EP mode recording is automatically detected and played back at the correct speed.
- Irrespective of the S-VHS mode button setting, the S-VHS or VHS recording mode is automatically detected and played back in the correct mode. The S-VHS mode indicator lights for playback of S-VHS recordings.
- When the PLAY/X2 button is pressed to start playback, the VIDEO mode is automatically entered and the VIDEO indicator on the FDP lights.
- The tape-end auto rewind mechanism functions in the Play, Fast Forward and Variable Search modes.
- Noise bars may appear on the screen if you play back a tape which was recorded using another recorder. In such cases, adjust the TRACKING controls. Press one of the buttons until a satisfactory picture is obtained. After playback, tracking may be reset manually by pressing both buttons simultaneously. It is reset automatically when the tape is ejected or the power turned off.
- Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control.
- When listening through headphones, if the volume is too low or too high, adjust the PHONES LEVEL control for comfortable listening.

SPECIAL-EFFECTS PLAYBACK

When one of the following modes is engaged, the digital circuitry is automatically activated to help compensate for picture quality deterioration. Therefore, stills, slow-motion and fast-motion pictures are all cleaner than before. The "DIGITAL" indicator will remain lit while in these modes.

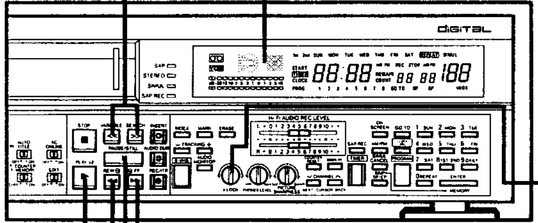
VARIABLE SEARCH buttons

- To search in the forward direction, press the ≫ button in the Play mode; slow-motion playback at 1/30 the normal speed is engaged.
  To increase the speed (to 1/24, 1/18, 1/12, 1/6, normal, 2X, 3X, 5X and 7X), press the ≫ button; to decrease the speed, press the ≪ button. Pressing the ≪ button from 1/30, the direction changes to reverse search.
- To search in the reverse direction, press the ≪ button in the Play mode. Reverse playback at normal speed is engaged.
  To increase the speed, press the ≪ button; to decrease the speed, press the ≫ button. Pressing this ≫ button from normal speed changes the direction to forward search.



Mode indicator

FF:	▷▷	STILL:	⁞⁞
REW:	◁◁	SLOW:	▷⁞⁞
FF SHUTTLE SEARCH:	▷▷▷	REW SHUTTLE SEARCH:	▷◁◁



High-speed reverse search
REW button

- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY/X2 button to return to normal playback.

Double-speed playback
PLAY/X2 button

- Press while in the Play mode; double-speed playback will be engaged.
- To resume normal playback, press the same button again.

High-speed forward search
FF button

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY/X2 button to return to normal playback.

Still playback
PAUSE/STILL button

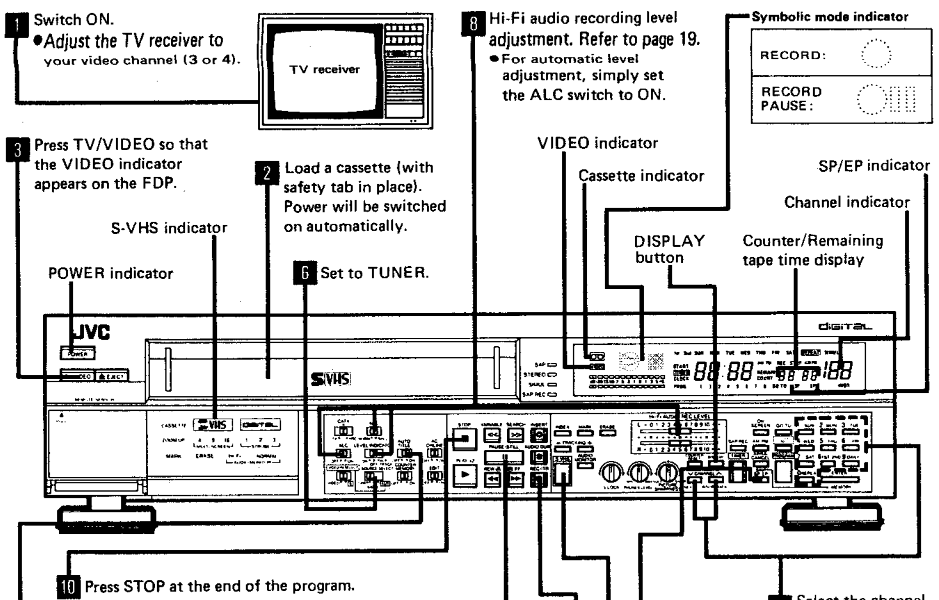
- Press while in the Play mode; the tape will stop and a still picture will be obtained.
- To advance the still picture, press again.
- To return to the normal Play mode, press the PLAY/X2 button.

Notes:

- For briefer scanning, keep the REW or FF button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled. In this case, the shuttling speed in the EP mode is about 7 times normal.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by turning the V.LOCK control.
- If noise bars are visible, use the TRACKING controls as described on the previous page.
- With some video cassettes, the TV picture may distort during slow-motion playback. This is not due to any defect of the unit.
- Special-effects playback is not possible in the LP mode. When the Special-effects mode is engaged during playback of LP recorded tapes, the picture disappears from the screen. If you happen to engage one of the Special-effects modes while playing an LP tape, simply press the PLAY/X2 button to restore the picture.

BASIC OPERATION FOR RECORDING TV PROGRAMS

Basic concept: receive the desired TV program with the built-in tuner and operate the tape section for recording.



1 Switch ON.
●Adjust the TV receiver to your video channel (3 or 4).

2 Load a cassette (with safety tab in place). Power will be switched on automatically.

3 Press TV/VIDEO so that the VIDEO indicator appears on the FDP.

4 For S-VHS recording, press S-VHS so that the S-VHS indicator will light.

5 Select the recording speed (SP or EP).
SP: 2 hours 40 minutes with a T-160 cassette.
EP: 8 hours with a T-160 cassette.
(Check the SP/EP indicator on the FDP.)

6 Set to TUNER.

7 Select the channel you wish to record.

8 Hi-Fi audio recording level adjustment. Refer to page 19.
●For automatic level adjustment, simply set the ALC switch to ON.

Symbolic mode indicator

RECORD:	○
RECORD PAUSE:	○‖

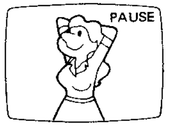
9 Press REC/ITR once to start recording. (When using the remote control unit, press the REC and PLAY/X2 buttons simultaneously.)

10 Press STOP at the end of the program.

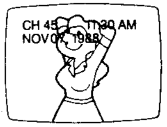
AUTO TITLE switch

If you wish the recording data to be recorded at the beginning of a program, set the AUTO TITLE switch to ON. Each time recording is initiated from the Stop or Timer Standby mode, the channel, time and date will be recorded for about 5 seconds.

PAUSE/STILL button



On-screen Pause Mode indicator



The recording data can also be recorded by pressing the MARK button during recording (with the AUTO TITLE switch set to ON). If you wish this recording to be performed when starting a recording from the Record-Pause mode, press the MARK button in the Record-Pause mode and then start recording by pressing the PLAY button.

Notes:
- If the REC/ITR button is pressed more than once, the Instant Timer Recording mode will be entered (see page 26). To return to ordinary recording, repeatedly press the REC/ITR button until the REC STOP indicator in the FDP is extinguished.
- If there is part of the program you do not want to record, press the PAUSE/STILL button. To release the Pause mode, press the PLAY/X2 button.
- When recording is restarted from the Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause are erased due to overlap of the new recording. This is not due to any defect of the unit.
- If the REC button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 6.)
- When the Pause mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- When a recording containing assemble edits (segments recorded using the PAUSE function) is played back, color noise may appear momentarily at edit points. This is not due to any defect of the unit.
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- Press the DISPLAY button to check how much recording time is left.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Pause mode and then select a different channel.

INSTANT TIMER RECORDING

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

1 Press REC/ITR while recording (or twice if in the Stop mode).
●The following indication will appear on the display, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

REC STOP
0:30

2 Each time the REC/ITR button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the REC/ITR button is pressed again, the Normal Recording mode will be entered.

REC STOP
4:00

- For a more precise time setting, use the numeric keys to set to the exact time required.

1. After "0:30" has appeared, specify the time using the numeric keys.
   ●Always key in a full number including hours and minutes.
2. Press the REC/ITR button immediately (within 4 seconds).

Notes:
- Time setting in the Instant Timer Recording mode is possible up to a maximum of 8 hours 59 minutes if the numeric keys are used.
- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Recording mode, press the STOP button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the PLAY/X2 button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than about 5 minutes, the mode is released and the power is switched off.
- If you want to check the Remaining tape time or Counter reading while performing instant timer recording, press the DISPLAY button to obtain the desired indication (the REC STOP indication disappears). To return to the REC STOP indication, press the REC/ITR button once, or wait for about 5 seconds and the remaining time indication will reappear automatically.

RECORDING ONE TV PROGRAM WHILE WATCHING ANOTHER

A program not being viewed can be recorded while you enjoy another program. This permits the recorded program to be played back later at your convenience.
The recording procedure is exactly the same as described on the previous page. The points to be remembered are:
- Select the channel you wish to record with the recorder's channel select buttons.
- Select the channel you wish to view with the TV receiver's channel selector.
- Make sure that the VIDEO indicator is not lit on the FDP. If lit, press the TV/VIDEO button so that it extinguishes.

RECORDING STEREO TV PROGRAMS

When stereo TV programs are broadcast, the HR-S8000U is capable of automatically receiving them in stereo. When a stereo program is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in monaural on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR select button to Hi-Fi (the Hi-Fi indicator lights).

RECORDING SAP (Second Audio Program) TV PROGRAMS

When an SAP TV program is being received, the SAP indicator lights. To record such a program, pay attention to two additional controls and the basic operation described on the previous page.
- Press the SAP REC button so that the SAP REC indicator lights, to record the second audio program. To record the main audio program only, release this button (the SAP REC indicator is off).
- Set the AUDIO MONITOR select button to NORMAL (the NORMAL indicator lights) to listen to the SAP soundtrack being recorded.

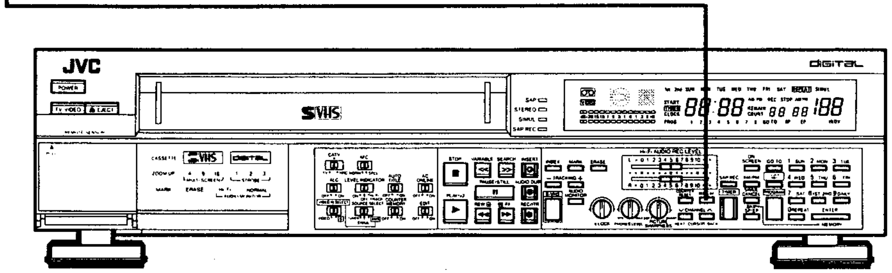
Note:
- SAP programs can be recorded only on the normal audio track. It is not possible to record any SAP program on the hi-fi audio track, regardless of the setting of any switch.

REMAINING TAPE TIME INDICATOR

The tape counter is switchable to the remaining tape time indicator.

1 Press the DISPLAY button to obtain the Remaining Tape Time mode.

2 The remaining tape length will be shown in hours and minutes.



Notes:
- During recording, the remaining tape length is calculated in reference to the recording mode selected by the SP/EP button; during playback, it is calculated in reference to the recording mode of the tape being played (SP/EP).
- The indicated remaining time is approximate. The time required to calculate the remaining tape length and the accuracy of that calculation may vary according to the type of cassette tape. (The remaining time indication is not available if this mode is engaged from Fast Forward or Rewind.)

NEXT-FUNCTION MEMORY

Memory Play function
- If you want to watch the tape from its beginning after rewinding, press the REW button and than PLAY/X2 within 2 seconds. Playback will start automatically at the beginning of the tape. (The COUNTER MEMORY switch must be in the OFF position.)
- If you want to watch the tape from the counter reading of "0000", shift the COUNTER MEMORY switch to the ON position. Then press the REW (or FF) button and then PLAY/X2 within 2 seconds.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY/X2, FF, REW).

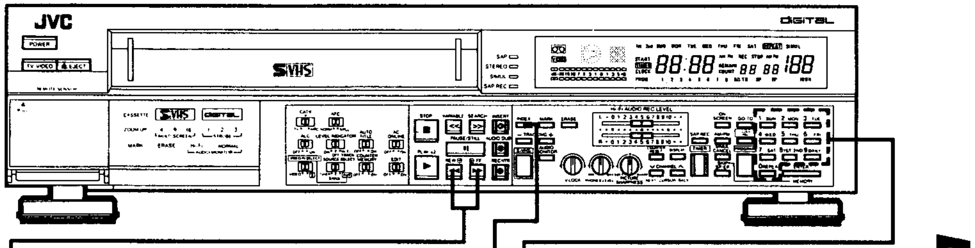
Memory Eject/Power-Off/Timer Standby
If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you do not have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press REW and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press STOP.)
- To turn the power off after rewind press REW and then POWER within 2 seconds. (To cancel the Memory Power-off mode, press POWER.)
- To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER.)

Memory Play	REW/FF	→	PLAY/X2	PLAY	Blinking	→	Play mode
Memory Eject	REW	→	EJECT	⏏	Blinking	→	Cassette ejected
Memory Power-off	REW	→	POWER	POWER	Blinking	→	Power off
Memory Timer Standby	REW	→	TIMER	TIMER	Lights	→	Timer standby mode
		within 2 seconds					

INDEX SEARCH FUNCTION

The Index Search function gives you automatic access to the beginning of individual recordings, and to index codes placed by you within those recordings. With the HR-S8000U, you can access any one of up to 9 of these indexed segments in either the forward or reverse direction.

Using the Index Search function



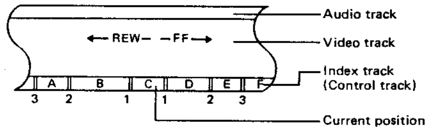
1 Press the INDEX button (on the recorder or remote control) while in the Play or Stop mode.
- The channel display of the FDP will change to the Index Search mode.

2 Specify the index number using one of the numeric keys.
- The specified number will appear in the FDP.

3 Press either FF or REW within 2 seconds.
- The tape will move and the index numbers count down to 0, where normal playback will start.
- If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the PLAY/X2 or STOP button.
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

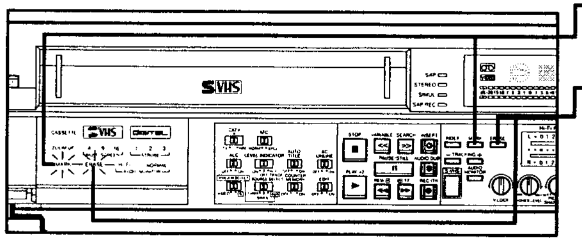
Tips for specifying the index number



- "1" + FF moves playback to the beginning of segment D.
- "1" + REW moves playback to the beginning of segment C.
- "2" + REW moves playback to the beginning of segment B.
- If no number is entered, a value of "1" is assumed.

Changing the index codes
Index codes are automatically placed at the beginning of recordings which are started from the Stop or Timer mode.

You can use the MARK button to add extra codes, and the ERASE button to erase codes. In neither case is there any effect on the audio or video recordings on the tape.



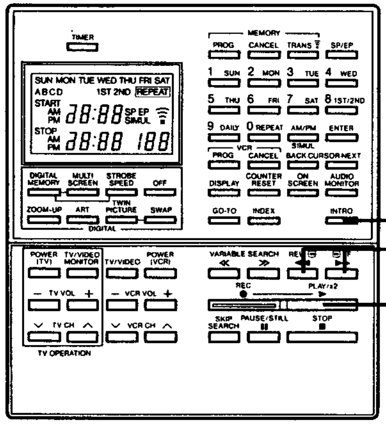
MARK
In the Play or Record mode, press this button once to put an index code onto the tape.
The LED blinks during the marking process.

ERASE
In the Play or Still mode, press this button to erase the next index code. First the Shuttle Search mode will be engaged and, when an index code is detected, it will be erased automatically. Then the Erase mode is cancelled and playback resumes.
The LED remains lit during the searching process and blinks during the erasing process.

Notes:
- If the AUTO TITLE switch is set to ON, both the index code and the recording data will be recorded by pressing the MARK button.
- The index codes on a tape with its safety tab removed cannot be changed.
- While the index code is being searched for in the Erase mode, random noise appears on the screen.
- Changing the index codes in the vicinity of switching points between SP and EP recordings will distort the pictures.

INTRO SEARCH FUNCTION

The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a program each time an index code is detected.

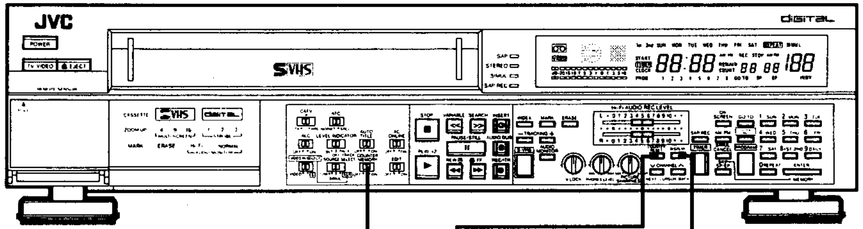

TIMER
MEMORY
PROG
CANCEL
TRANS
SP/EP
SUN MON TUE WED THU FRI SAT
ABCD
1ST 2ND
REPEAT
START
STOP
AM
PM
SP EP
SIMUL
1 SUN
2 MON
3 TUE
4 WED
5 THU
6 FRI
7 SAT
8 1ST/2ND
9 DAILY
0 REPEAT
AM/PM
ENTER
VCR
SIMUL
BACK CURSOR NEXT
DIGITAL MEMORY
MULTI SCREEN
STROBE SPEED
OFF
ZOOM-UP
ART
TWIN PICTURE
SWAP
DIGITAL
DISPLAY
COUNTER RESET
ON SCREEN
AUDIO MONITOR
GO-TO
INDEX
INTRO
POWER (TV)
TV/VIDEO MONITOR
TV/VIDEO
POWER (VCR)
VARIABLE SEARCH
REW
FF
REC
PLAY/X2
TV VOL
VCR VOL
TV CH
VCR CH
SKIP SEARCH
PAUSE/STILL
STOP
TV OPERATION

1 Press the INTRO button while in the Play or Stop mode.
- ●The INDEX indicator on the FDP will light.

2 Press the FF or REW button within 2 seconds.
- ●The Intro Search will start in the corresponding direction.
- ●Each time an index code is detected, the corresponding part is played back at the search speed (7 times normal in SP and 21 times normal in EP mode) for about 5 seconds.

3 When you find the section you want to view, simply press the PLAY/X2 button.
- ●Normal playback will start.

COUNTER MEMORY FUNCTION


JVC
DIGITAL
S-VHS

Counter Memory function
1. Press the DISPLAY button to obtain the Counter mode.
2. Press the COUNTER RESET button at a point which you may wish to locate later.
   - ●The tape counter will indicate "0000".
3. Set the COUNTER MEMORY switch to ON.
4. Press the REW (or FF) button when you need to return to the designated point.
   The tape will rewind (or fast forward) and stop at about the "0000" counter reading automatically.

DISPLAY button
When the POWER button is pressed, or a cassette is inserted, the tape counter appears on the display with the COUNT indicator illuminated. To check the length of tape left, press the DISPLAY button to engage the Remaining Time mode. (See page 27.)

COUNTER RESET button
Press to reset the tape counter to "0000".
Note:
Unless the COUNTER RESET button is pressed, or a cassette leader tape detected (see page 30), the count is maintained even after the POWER button is pressed to off (as long as the unit is plugged into an AC outlet).

COUNTER GO-TO FUNCTION

The counter Go-To function gives you direct access to any point on the tape by simply specifiying a desired counter reading. Depending on your command, the tape will either stop at the point or playback will start automatically from there.

2 Press the GO-TO button.
- ●The counter will change to the Go-To mode.
  There are three possible cases:
  (1) Counter reading changes from one number to another.

  COUNT 05 20 → COUNT 12 30 GO-TO

  Relative count — Absolute count

  (2) Counter reading remains unchanged.

  COUNT 12 30 → COUNT 12 30 GO-TO

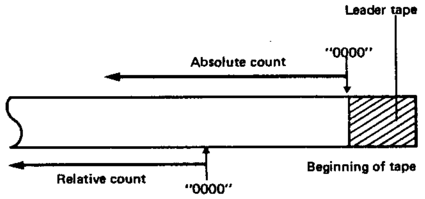
  Absolute count — Absolute count

  (3) "----" appears instead of a number.

  COUNT 05 20 → COUNT - - - - GO-TO

  - ●The recorder did not detect the leader tape when the cassette was loaded and, therefore, cannot determine the tape's present position in relation to its beginning.

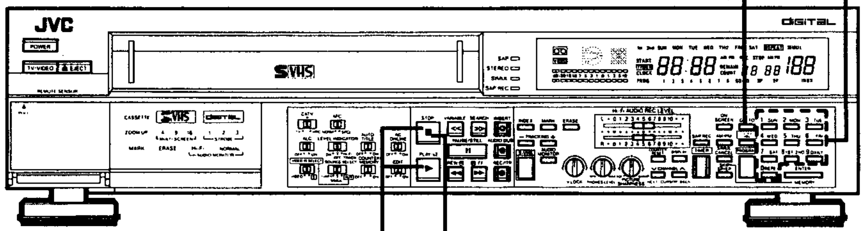
Absolute count vs. Relative count


Leader tape
"0000"
Absolute count
Beginning of tape
Relative count
"0000"

- ●The absolute "0000" count is automatically set when the leader tape is detected at the time of cassette loading.
- ●The relative "0000" count is set when the COUNTER RESET button is pressed, and does not apply to the counter Go-To procedure.

3 Specify the point you want to locate by using the 10 numeric keys.

COUNT 12 40 GO-TO


JVC
DIGITAL
S-VHS

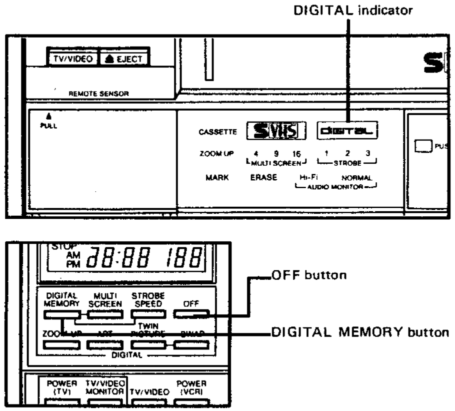
1 Engage the Stop mode.

4 Press the PLAY/X2 or STOP button.
- ●In cases (1) and (2), the tape will either fast forward or rewind to the specified point.
- ●In the case of (3), the tape is first rewound to the beginning of the tape (where the counter is automatically reset to "0000") and then is fast forwarded to the specified point.
- ●Once the beginning of the tape is detected in this way, the tape counter always reads the position in relation to the beginning until the COUNTER RESET button is pressed at a different position.

- If the specified number exceeds the tape length, the tape is first fast forwarded to its end, then rewound to its beginning and stops.
- Use of the Go-To function cancels the previous relative count.
- Press the PLAY/X2 or STOP button to cancel the Go-To function and enter the Play or Stop mode.

The HR-S8000U incorporates digital memory circuits to provide a variety of special effects during recording, and while watching a recorded tape or a regular television broadcast.

DIGITAL FREEZE FUNCTION


DIGITAL indicator
OFF button
DIGITAL MEMORY button
TV/VIDEO
EJECT
REMOTE SENSOR
PULL
CASSETTE
ZOOM UP
MARK
ERASE
4 9 16
MULTI SCREEN
1 2 3
STROBE
Hi-Fi
NORMAL
AUDIO MONITOR
DIGITAL MEMORY
MULTI SCREEN
STROBE SPEED
OFF
TWIN
DIGITAL
POWER (TV)
TV/VIDEO MONITOR
TV/VIDEO
POWER (VCR)

Note:
To use the HR-S8000U as a special-effects generator while watching television, engage the HR-S8000U in the VIDEO mode, set the TV receiver to your video channel and select the channel you wish to view with the HR-S8000U's channel selector.

Digital Freeze:
A still picture stored in memory is continuously reproduced on the TV screen while the tape runs or a regular broadcast continues. The soundtrack is not affected. If this mode is engaged during recording, the frozen picture will be continuously recorded.

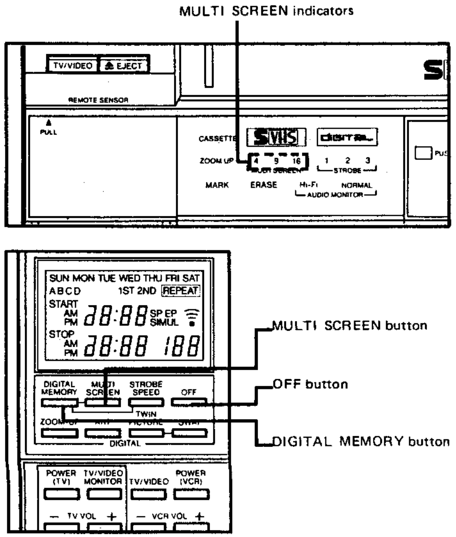
1 While in the Play or Record mode (or while viewing a television program), press the DIGITAL MEMORY button.
- The picture is "frozen" on the screen at the instant of pressing.
- The soundtrack continues unaffected.
- The "DIGITAL" indicator will light.

2 To switch to another still picture, press the DIGITAL MEMORY button again.

3 To restore normal pictures, press the OFF button.

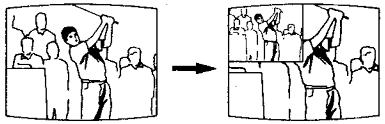
MULTI-SCREEN DIGITAL FREEZE FUNCTION

Multi-Screen Digital Freeze:
Selected still pictures are displayed on split screens.

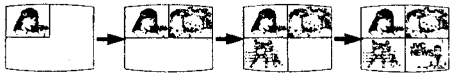

MULTI SCREEN indicators
MULTI SCREEN button
OFF button
DIGITAL MEMORY button
SUN MON TUE WED THU FRI SAT
ABCD 1ST 2ND REPEAT
START
STOP
SP EP
SIMUL
TV VOL
VCR VOL

1 While in the Play or Record mode (or while viewing a television program), press the MULTI SCREEN button to select the desired Multi Screen mode.
- The first pressing engages the 4-screen mode, then each subsequent pressing changes the number of sub-screens to 9 and 16. Pressing once again cancels the Multi-Screen mode.
- The corresponding MULTI SCREEN indicator will light.

2 Press the DIGITAL MEMORY button.
- The picture will be frozen and the ongoing program will continue in a sub-screen appearing in the upper left corner.
- The "DIGITAL" indicator will light.



3 Each time the DIGITAL MEMORY button is pressed, still pictures will fill the subsequent sub-screens.
- When the last sub-screen is frozen by pressing the DIGITAL MEMORY button, the program will continue in the first sub-screen and another cycle of selecting still pictures for each of the sub-screens can be performed.

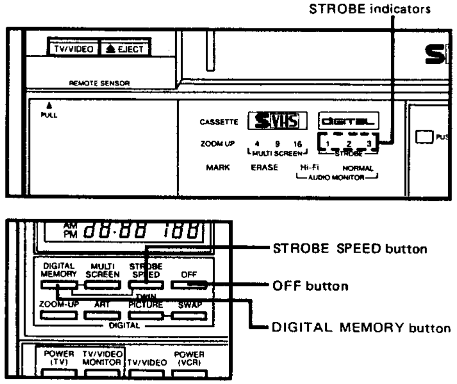


4 To restore normal pictures, press the OFF button.

Note:
- The images on the screen will become distorted if you change the channel while remaining in the Multi-Screen Digital Freeze mode.

DIGITAL STROBE FUNCTION

Digital Strobe:
A still picture selected at regular intervals from the tape or broadcast and stored in memory is continuously reproduced on the screen while the tape or broadcast continues with its soundtrack unaffected. The regular changing of the stored picture results in a strobe-light or time-lapse effect. Strobing at three different speeds can be selected. When applied during recording, the strobing pictures will be recorded.


STROBE indicators
STROBE SPEED button
OFF button
DIGITAL MEMORY button
ZOOM-UP
ART
PICTURE
SWAP

1 While in the Play or Record mode (or while watching a television program), press the STROBE SPEED button to select the desired speed.
- Each time the STROBE SPEED button is pressed, the speed becomes faster in the order of 1, 2, 3, then Freeze and then returns to 1.

Strobe Speed

Indication	Strobing interval
STROBE 1	Approx. 0.6 sec
2	Approx. 0.3 sec
3	Approx. 0.1 sec

- The selected speed will be indicated by one of the STROBE indicators.
- After speed 3, a still picture is maintained as in the Digital Freeze mode.

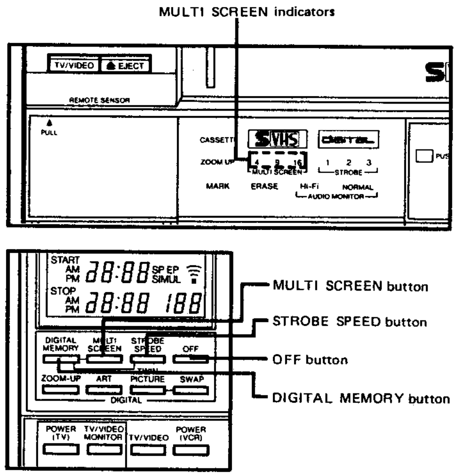
2 Press the DIGITAL MEMORY button while in the Play mode (or while watching a television program).
- Strobing will start at the selected speed.
- The "DIGITAL" indicator will light.
- To change the strobe speed, press the STROBE SPEED button the required number of times.

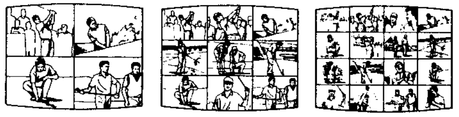
3 To restore normal pictures, press the OFF button.

Note:
- It is also possible to perform strobing by first engaging the Digital Freeze mode and then selecting the speed.

MULTI-SCREEN DIGITAL STROBE FUNCTION

Multi-Screen Digital Strobe:
Still pictures are displayed on sub-screens successively at the selected strobe speed.


MULTI SCREEN indicators
MULTI SCREEN button
STROBE SPEED button
OFF button
DIGITAL MEMORY button



1 While in the Play or Record mode (or while watching a television program), press the MULTI SCREEN button to select the desired Multi Screen mode.
- The corresponding MULTI SCREEN indicator (4, 9 or 16) will light.

2 Press the STROBE SPEED button.

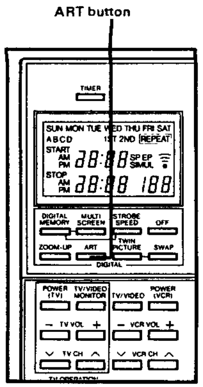
3 Press the DIGITAL MEMORY button to start strobing.
- The still picture coinciding with the pressing of the button will be displayed on sub-screens and those sub-screens will be filled with different still pictures automatically at a constant speed.
- The "DIGITAL" indicator will light.
- After all sub-screens have been filled with still pictures, the screen remains unchanged.

4 To restart strobing, press the DIGITAL MEMORY button; the first pressing changes the picture on the first (upper left-corner) sub-screen into a normal moving picture, and the second pressing starts strobing.

5 To restore normal pictures, press the OFF button.

Notes:
- Once the DIGITAL MEMORY button has been pressed, it is not possible to alter the number of screens.
- The images on the screen will become distorted if you change the channel in the middle of strobing. To change the channel, first cancel the digital mode by pressing the OFF button.

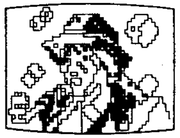
DIGITAL ART EFFECTS


ART button
TIMER
SUN MON TUE WED THU FRI SAT
ABCD 1ST 2ND REPEAT
START AM PM
STOP AM PM
SP EP SIMUL
DIGITAL MEMORY
MULTI SCREEN
STROBE SPEED
OFF
ZOOM-UP
ART
TWIN PICTURE
SWAP
DIGITAL
POWER (TV)
TV/VIDEO MONITOR
TV/VIDEO
POWER (VCR)
TV VOL
VCR VOL
TV CH
VCR CH

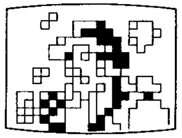
Mosaic effects:

Reproduces the image with square patterns. Two different patterns are available.

Mosaic 1
A pattern of smaller squares



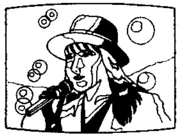
Mosaic 2
A pattern of larger squares



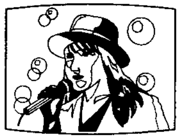
Solarization effects:

Solarizes the color of the image as with a paint-brush.

Solarization 1
Stronger solarization



Solarization 2
Weaker solarization



1. Press the ART button while in the Play or Record mode (or while watching a television program).
   - Each time the ART button is pressed, the mode changes in the order of Mosaic 1, 2, Solarization 1, 2 and then returns to Mosaic 1.
   - The "DIGITAL" indicator will light.
2. Press the OFF button to restore normal pictures.

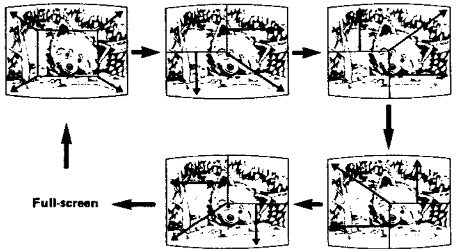
Note:
- The Digital Art function can also be used in combination with the following functions:
  - Digital Freeze
  - Digital Strobe

DIGITAL ZOOM FUNCTION

Digital Zoom:

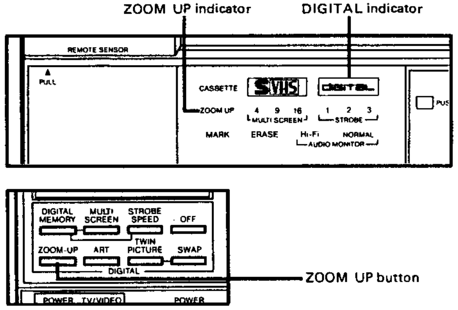
Enlarges the desired quarter of the picture on the screen to a full-screen picture. The displayed pictures are moving pictures.

1. Press the ZOOM UP button while in the Play or Record mode (or while viewing a television program).
   - The center quarter of the picture will be enlarged to full-screen size.
   - Each time the ZOOM UP button is pressed, the position of the quarter to be enlarged changes in the order as shown below:


Full-screen

- While in the Digital Zoom mode, the ZOOM UP and DIGITAL indicators remain lit.

2. To restore normal pictures, press the OFF button.


ZOOM UP indicator
DIGITAL indicator
REMOTE SENSOR
PULL
CASSETTE
ZOOM UP
4 9 16
MULTI SCREEN
1 2 3
STROBE
MARK
ERASE
Hi-Fi
NORMAL
AUDIO MONITOR
DIGITAL MEMORY
MULTI SCREEN
STROBE SPEED
OFF
ZOOM-UP
ART
TWIN PICTURE
SWAP
DIGITAL
POWER
TV/VIDEO
ZOOM UP button

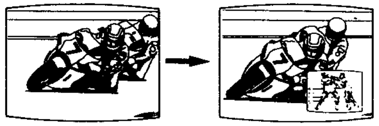
Notes:
- In the Digital Zoom mode, the picture may become slightly more grainy or it may look split into upper and lower halves.
- With some televisions, the zoomed-up picture may not completely fill the entire screen. This is not due to any defect of the unit.

PICTURE-IN-PICTURE AND SWAP FUNCTIONS

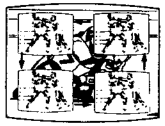
Picture-In-Picture:

During tape playback, a TV broadcast received by the VCR's built-in tuner is displayed in an inset window.

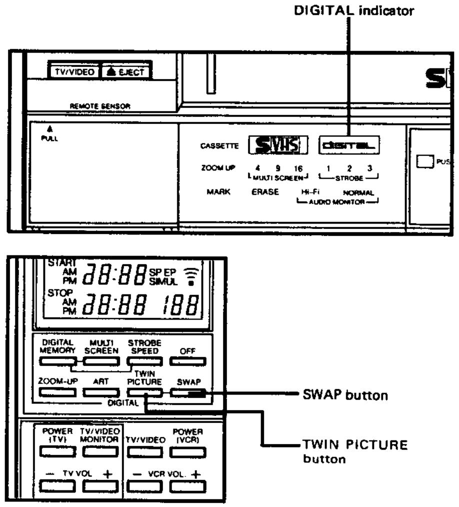
1. While in the Play mode, press the TWIN PICTURE button.
   - A sub-screen corresponding to the size of the 9-screen mode will appear in the lower right-hand corner and show a program from the selected channel of the VCR's tuner.



- The "DIGITAL" indicator will light.
- Each pressing of the TWIN PICTURE button shifts the position of the window as follows:



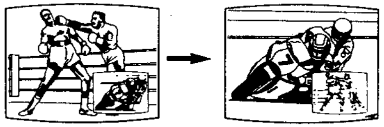
- To view another program in the window, select a different channel on the VCR.
- If an external source is selected, this can be displayed as well.


DIGITAL indicator
TV/VIDEO
EJECT
REMOTE SENSOR
PULL
CASSETTE
ZOOM UP
4 9 16
MULTI SCREEN
1 2 3
STROBE
MARK
ERASE
Hi-Fi
NORMAL
AUDIO MONITOR
START AM PM
STOP AM PM
SP EP SIMUL
DIGITAL MEMORY
MULTI SCREEN
STROBE SPEED
OFF
ZOOM-UP
ART
TWIN PICTURE
SWAP
DIGITAL
POWER (TV)
TV/VIDEO MONITOR
TV/VIDEO
POWER (VCR)
TV VOL
VCR VOL
SWAP button
TWIN PICTURE button

Swap function:

The swap function allows the switching of pictures between the main screen and window.

2. To switch pictures between the main screen and window, press the SWAP button.



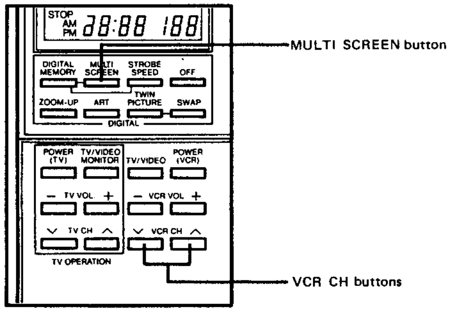
3. To restore normal playback pictures, press the OFF button.

Notes:
- With some televisions, the position of the window could be such that its edge exceeds the frame of the main screen.
- If the reception quality of the TV program on the main screen is inferior, the picture in the window may not be normal.
- If the program on the main screen is monochrome, the picture in the window will also be monochrome.

MULTI-SCREEN CHANNEL SCAN FUNCTION

Multi-Screen Channel Scan:

Broadcast programs are displayed as still pictures on sub-screens as channel scanning proceeds. This multi-screen picture cannot be recorded.



1. Press the MULTI SCREEN button to select the desired Multi-Screen mode.
2. With the TV program displayed on the screen, press the VCR CH "∨" or "∧" button to scan channels; "∨" to scan channels lower than the currently tuned-in and "∧" to scan channels higher than the currently tuned-in.
   - The "DIGITAL" indicator will light.
   - The sub-screens will be filled sequentially with still pictures of tuned-in channels.
   - After all sub-screens have been filled with still pictures, the screen remains unchanged.
   - To continue scanning, press the VCR CH "∨" or "∧" button.
3. To cancel the Multi-Screen Channel Scan mode, press the OFF button.

MULTI-SCREEN INTRO SEARCH FUNCTION

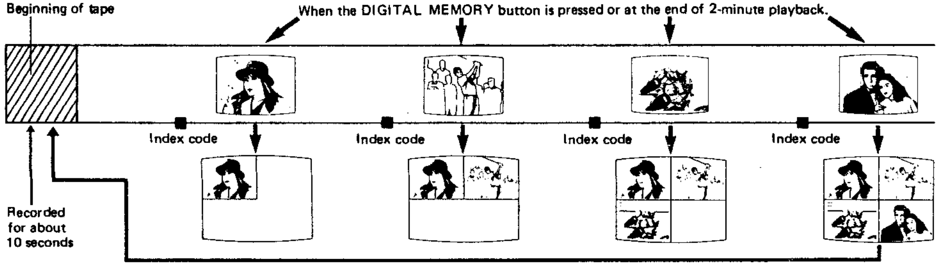
Multi-Screen Intro Search:

Using the Multi Screen mode and the Index Search function, displays the still pictures located at detected index codes and, after completion of the search, records the multi-screen image at the beginning of the tape.

1. Press the MULTI SCREEN button to select the desired Multi Screen mode (4, 9 or 16).
   - Always start Intro Search from the beginning of the tape.
2. Press the INTRO button.
   - The "DIGITAL" indicator will light.
3. Press the FF button
   - When an index code is detected, playback starts automatically and continues for about 2 minutes.
   - Intro Search in the reverse direction is not possible.
4. Press the DIGITAL MEMORY button while playback continues.
   - The picture coinciding with the pressing of the button is displayed on the upper left-hand corner sub-screen.
   - If the DIGITAL MEMORY button is not pressed, the last picture of the 2-minute playback remains displayed on the sub-screen as a still picture.
   - Then the Fast-Forward mode is automatically engaged to detect the next index code.
5. When all sub-screens have been filled with still pictures or the end of the tape is reached, the Rewind mode is engaged (Auto Rewind).
6. When the tape is rewound to the beginning, the multi-screen picture is automatically recorded at the beginning of the tape for about 10 seconds.
   - If the safety tab of the cassette has been removed, this recording will not take place.
7. The VCR enters the Stop mode automatically and the Digital function is also cancelled.

Notes:

- To cancel the Intro Search mode midway, press the OFF button or STOP button.
- The recorded program at the beginning of the tape will be replaced for about 10 seconds by the multi-screen picture by automatic recording. (This recording will not take place if there are no index codes on the tape.)
- Programs between index codes less than 2 minutes away from each other will not be memorized automatically.


Beginning of tape
When the DIGITAL MEMORY button is pressed or at the end of 2-minute playback.
Index code
Index code
Index code
Index code
Recorded for about 10 seconds

AUTOMATIC TIMER RECORDING

The built-in 14-day/8-event programmable timer permits recording of preset channels on preset days at preset times for preset lengths while you are away.

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Three ways to perform timer programming

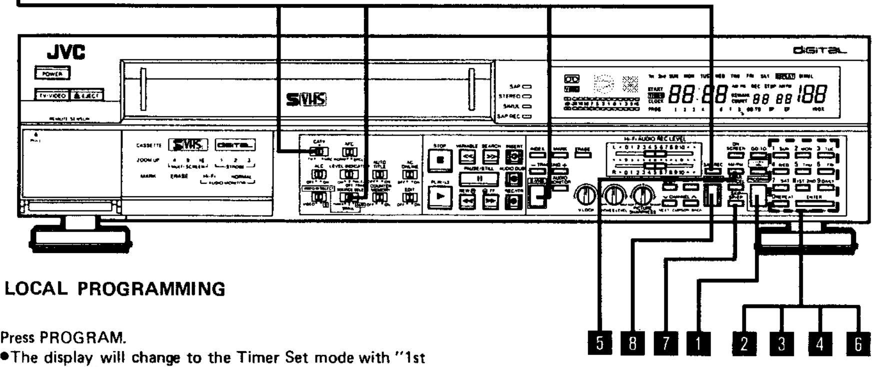
- **A. Local programming:** Program the timer using the recorder's controls while referring to the recorder's FDP.
- **B. Direct remote programming:** Program the timer using the remote control's keys while referring to the on-screen display.
- **C. Independent remote programming:** Program the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder.

Basic steps in programming

- Data input is possible where the cursor (blinking position) is located.
- Set the data and press the ENTER button; the data will be stored in memory.

Make sure of the settings of these switches:

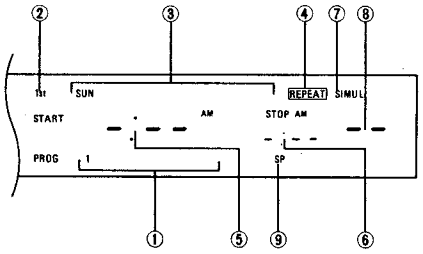
SOURCE SELECT:	TUNER (or SIMUL)
SAP REC:	As required.
TV/CATV/HRC:	As required.
S-VHS:	As required.



A. LOCAL PROGRAMMING

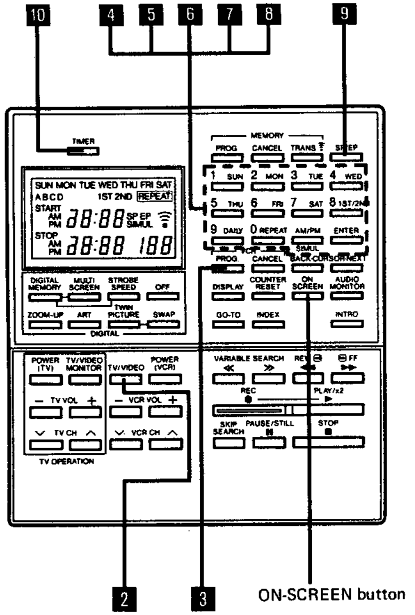
1. Press PROGRAM.
   - The display will change to the Timer Set mode with "1st SUN" ② ③ blinking and program number "1" ① displayed. You are ready to enter the data into No. 1 program memory. To change the program number, press the PROGRAM button the required number of times.
2. Key in the day ③; and press ENTER.
   - To set for the 2nd week, press 8 either before or after setting the day.
   - To set for weekly serial recording ④, press 0.
   - To set for daily serial recording, press 9.
3. Key in the start time ⑤ and press ENTER.
   - To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
   - Invalid time numbers will be rejected (see page 39).
4. Key in the stop time ⑥ and press ENTER.
   - Specify AM or PM in the same way for the start time.
5. To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦.
6. Key in the channel number ⑧ and press ENTER.
   - Invalid channel numbers will be rejected.
7. Specify the recording speed ⑨ by pressing SP/EP and press ENTER.
   - Now you can advance to the next program, if necessary, by pressing the PROGRAM button.
   - After all necessary programs have been preset, proceed to the next step.

FDP



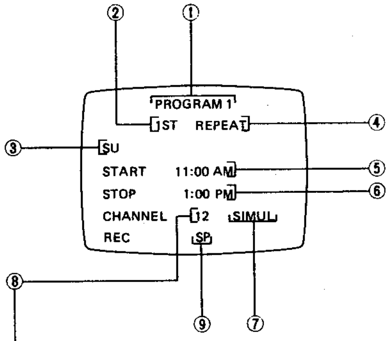
8. Press TIMER.
   - The TIMER indicator will light. (For error indications, see page 39.)
   - The display will return to the Clock mode, also showing the program numbers for which recording data has been programmed.

B. DIRECT ON-SCREEN REMOTE PROGRAMMING



ON-SCREEN display

ON-SCREEN



- "TU OFF" appears when the SOURCE SELECT switch is set to AUX; channel setting is not possible.

1 Turn on the TV receiver and set to your video channel (3 or 4).

2 Press the TV/VIDEO button to engage the VIDEO mode.

3 Press VCR PROG.
- The picture on the TV screen will change to the On-Screen Timer Set mode with "1ST SU" ② ③ blinking and "PROGRAM 1" ① displayed. You are ready to enter the data into No. 1 program memory. To change the program number, press the VCR PROG. button the required number of times.
- To cancel the On-Screen Timer Set mode in the middle of timer programming, press the ON SCREEN button.
- Pressing the ON SCREEN button again, calls up the on-screen display.

4 Key in the day ③ ; and press ENTER.
- To set for the 2nd week, press [8] either before or after setting the day.
- To set for weekly serial recording ④, press [0].
- To set for daily serial recording, press [9].

5 Key in the start time ⑤ and press ENTER.
- To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
- Invalid time numbers will be rejected (see page 39).

6 Key in the stop time ⑥ and press ENTER.
- Specify AM or PM in the same way for the start time.

7 To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦ .

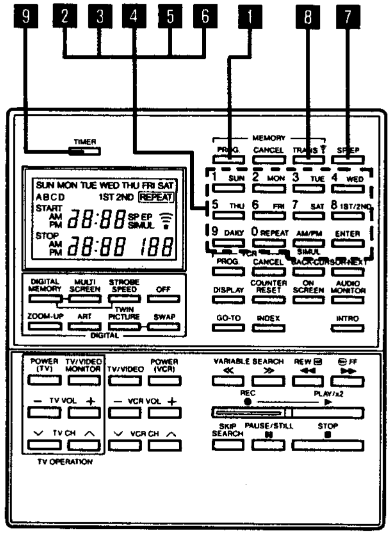
8 Key in the channel number ⑧ and press ENTER.
- Invalid channel numbers will be rejected.

9 Specify the recording speed ⑨ by pressing SP/EP and press ENTER.
- Now you can advance to the next program, if necessary, by pressing the VCR PROG. button.
- After all necessary programs have been preset, proceed to the next step.

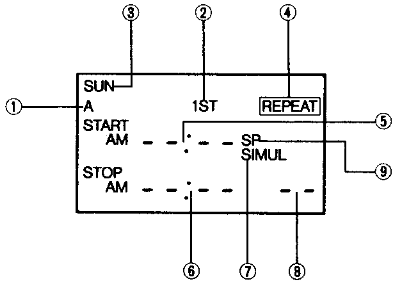
10 Press TIMER.
- The TIMER indicator will light. (For error indications, see page 39.)
- The display will return to the TV picture.

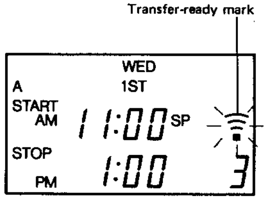
C. INDEPENDENT LCD REMOTE PROGRAMMING

- The remote control incorporates 4 program memories: A, B, C and D. These are independent of the VCR's timer memories 1 to 8.



- These 4 programs can be pre-programmed and held in memory. When transferred to the VCR memories, they are effective in controlling the VCR's starting and stopping.





1 Press MEMORY PROG.
- The LCD will be activated for program "A" ①, with "1ST SUN" ② ③ blinking.
- To advance to programs B, C or D, press again.

2 Key in the day ③ ; and press ENTER.
- To set for the 2nd week, press [8] either before or after setting the day.
- To set for weekly serial recording ④, press [0].
- To set for daily serial recording, press [9].

3 Key in the start time ⑤ and press ENTER.
- To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
- Invalid time numbers will be rejected (see next page).

4 Key in the stop time ⑥ and press ENTER.
- Specify AM or PM in the same way for the start time.

5 To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦ .

6 Key in the channel number ⑧ and press ENTER.
- Invalid channel numbers will be rejected.

7 Specify the recording speed ⑨ by pressing SP/EP, and press ENTER.
- After all program items have been set, the "transfer-ready" mark will appear and blink.

8 Direct the remote control to the recorder's REMOTE SENSOR window and press MEMORY TRANS.
- The programmed data will be loaded in one of the VCR's memories (1 – 8), the vacant one of the smallest number.
- If all program memories are full, the VCR's clock display will blink and transmission will not take place.
- When this happens, check the VCR's memories on-screen and cancel unnecessary programs. For this purpose, press the VCR PROG. button to call up the on-screen display and check programs one after another. When a program that you do not wish to keep is reached, cancel it by pressing the VCR CANCEL button.
- After having cleared the VCR's program memory, transfer the data once again. If the LCD goes out, press the MEMORY PROG. button to call up the desired program and, after making sure that the transfer-ready mark is blinking, press the MEMORY TRANS button.

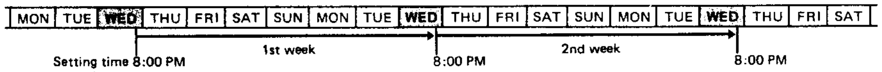
9 Press TIMER.
- The TIMER indicator on the FDP will light. (For error indications, see next page)

IMPORTANT INFORMATION ON TIMER RECORDING

Concept of "week"

- The 1st week or 2nd week do not refer to weeks on the calendar; the 1st week refers to the seven-day period from the present day and the 2nd week, to the following seven-day period. These two weeks are counted from the time of setting.

If the current day and time of setting are Wednesday, 8:00 PM:



Variety of day setting possibilities

Setting	Procedure
One day of the 1st or 2nd week.	Numeric keys "1" – "7" (and "8" for 2nd).
Weekly serial from the 1st week.	Numeric keys "1" – "7" and "0" for REPEAT.
Weekly serial from the 2nd week.	Numeric keys "1" – "7", "8" for 2nd, and "0" for REPEAT.
Daily serial (SUN through SAT) for one week or every week.	Numeric key "9" for all days. ● Press once to obtain SUN through SAT. ● Press again for MON through SAT. ● Press again for MON through FRI. ● "REPEAT" appears automatically with these indications. ● For daily serial recording only for one week, cancel "REPEAT" with numeric key "0".
Daily serial (MON through SAT) for one week or every week.	
Daily serial (MON through FRI) for one week or every week.	

Setting the timer

- Enter the data while the corresponding indication is flashing (about 60 seconds). If no command is entered within one minute, the display will return to the Clock mode.
- It is not possible to set the start and stop times unless the clock time has previously been set.
- The stop time can be set within 24 hours from the start time. The day indication will not change even if the stop time runs into the following day.
- The BACK/NEXT CURSOR buttons can be used to move the cursor. Use this function to reach positions which require correction. Press NEXT to move the cursor forward; press BACK to move the cursor back.
- If an invalid number is entered in time setting, the entered data is cleared and the display returns to a blinking "-:--" when the ENTER button is pressed. In case of correct entry, the blinking position advances to the next.

Last-channel memory

- The currectly tuned channel locks in the Timer Set mode and, when the display returns to the Clock mode, the locked channel is displayed.

Cancelling the preset data

- The preset programs can be cancelled by pressing the CANCEL button. For this purpose, first engage the Timer Set mode for the number you wish to cancel and then press the CANCEL button. With the remote control, to cancel the LCD memory, press the MEMORY CANCEL button; to cancel the VCR's memory, press the VCR CANCEL button.

Checking the programmed data

- Checking and re-programming can be performed anytime, even when the TIMER button has already been engaged in the ON position.
- To check the programmed data, press the PROGRAM button. To return to the Clock mode, press the DISPLAY button. The Clock mode will also be restored by pressing the PROGRAM button once after program number 8 is displayed.
- While recording is actually taking place, the stop time can be changed. Engage the Timer Set mode; only the stop time will flash. Re-program it.
- While recording is actually taking place according to one preset program, all other preset programs can be checked or re-programmed.

TIMER indicator (Error indication)

- When the TIMER button is pressed to ON with a cassette loaded and the timer correctly programmed, the TIMER indicator on the display will light with the corresponding preset program number(s) also lighting and the power is turned off.
- If two or more programs have overlapping times, the numbers of those programs will blink rapidly for 10 seconds after the TIMER button has been pressed. If no change is made in the programming, later programs will begin only after earlier programs are completed.
- When you have preset several programs at a time, confirm that all the preset program numbers light together with the TIMER indicator when the TIMER button is pressed. The program whose number does not light has not been correctly preset (for instance, the preset switch-on and switch-off times are the same). Recheck the programmed data.
- If all programs have been wrongly preset, the TIMER indicator will blink for about 10 seconds when the TIMER button is pressed, and then remains lit with no program number lighting.
- If the TIMER button is pressed when a cassette is not loaded, the TIMER indicator will continue blinking.
- If a cassette with its safety tab removed has been loaded, it will be ejected automatically when the TIMER button is pressed. The TIMER indicator will continue blinking.

Timer operation

- Tape loading starts 20 seconds before the preset switch-on time and the recording start signal is triggered 2 seconds before the preset time so that recording starts exactly at the preset time.
- During timer recording, the number of the program that is presently operating will be flashing.
- After timer recording, the power is switched off and the auto-rewind mechanism does not function. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off with the TIMER indicator blinking.
- If a power failure should occur (and last longer than about 60 minutes), not only time-keeping stops (see page 21), but also all the preset data will be cancelled. A flashing SUN AM 12:00 indicates this after power has been reapplied. In such cases, first correct the time indication and then re-enter the programming data.

RECORDING FM SIMULCAST TV PROGRAMS

FM simulcast TV programs can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the AUDIO IN connectors.) Select the TV channel broadcasting the simulcast program with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for this TV program.

The only difference from the basic recording procedure (described on page 25) is the setting of the SOURCE SELECT switch.

- Set the SOURCE SELECT switch to SIMUL.
  Then the SIMUL indicator will light. With this setting, the audio signals from the built-in tuner will be recorded on the normal audio track and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

Notes:

- After finishing recording, be sure to set the SOURCE SELECT switch to TUNER.
- While recording simulcast programs, the hi-fi sound might be distorted momentarily at switching points between different programs (at the insertion of commercials, for example). This is not due to any defect of the unit.

RECORDING A TV PROGRAM WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the "simulcast" recording function, you can record independent audio and video programs, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV program, record any audio source independently.

- Connect an audio component (such as an FM tuner) to the AUDIO IN connectors.
- Set the SOURCE SELECT switch to SIMUL.

Notes:

- If you stop recording to avoid unwanted material of the TV program using the PAUSE/STILL button, the audio program from the external source is also cut.
- If television broadcasting comes to an end during recording, the hi-fi sound being recorded from the external source may be distorted. It is recommended that you check the timetable of TV broadcasts in advance.
- After finishing recording, be sure to set the SOURCE SELECT switch to TUNER; otherwise recording on the hi-fi audio track from the built-in tuner will not be possible.

USING THE HR-S8000U AS AN AUDIO DECK

Audio-only recording

You can record audio only (without recording any video signal) on the normal and hi-fi audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160).

- Connect an audio source (such as an FM tuner) to the AUDIO IN connectors.
- DO NOT connect any equipment to the VIDEO IN connector.
- Set the SOURCE SELECT switch to AUX.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack. **Audio dubbing is applicable only to the longitudinal audio track (normal audio).** Therefore, a dubbed narration can be heard together with the original hi-fi sound.

Procedure

1. Switch on the TV receiver.
   - Adjust the TV receiver's channel to your video channel (3 or 4).
2. Load a pre-recorded cassette. Power will be switched on automatically.
3. Connect a microphone or an audio source to the MIC jack or the AUDIO IN connectors respectively.
   - With both microphone and audio source connected, mixed sound is recorded.
4. Set the SOURCE SELECT switch to AUX.
   - If you record sound only from the microphone, the source equipment connected to the AUDIO IN connectors should be off.
5. Press the PLAY/X2 button to start playback and then press the REW or FF button to search for the point from which you wish to start audio dubbing.
6. Press the PAUSE/STILL button at the start point of audio dubbing.
7. Press the AUDIO DUB button.
8. Press the PLAY/X2 button.
   - Audio dubbing will start.

Notes:

- It is recommended that you use a lower-impedance microphone.
- If a stereo source is connected to the AUDIO IN connectors, the mixed L and R sound is recorded.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the PHONES jack.

INSERT EDITING

Insert editing means recording a new scene into a section of pre-recorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at edit-in and edit-out points. Thanks to the flying erase head, clean edits can be obtained. New video and audio signals to be inserted can come either from another video cassette recorder or the built-in tuner.

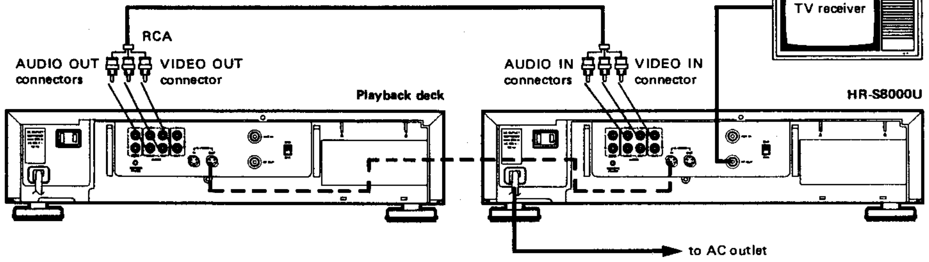
CAUTION
Since video and audio signals are recorded simultaneously, both are replaced with new recordings simultaneously. However, the normal audio soundtrack remains unchanged.

Setting options of the relevant switches

Source \ Switch	SOURCE SELECT switch
To insert programs from a different tape	AUX (with VIDEO IN SELECT set as required – see page 9)
To insert TV programs from the built-in tuner	TUNER
To insert FM simulcast programs	SIMUL

Connection

For inserting video and audio signals from another video cassette recorder.



Procedure

1. Switch on the TV receiver.
   - ●Adjust the TV receiver's channel to your video channel (3 or 4).
2. Load a pre-recorded cassette.
3. Press TV/VIDEO to engage the VIDEO mode (the indicator lights).
4. Set the SOURCE SELECT and VIDEO IN SELECT switches as required. (See chart above.)
5. Set the Hi-Fi audio recording level. (See page 19.)
6. Play back the tape to determine the edit-out point (the end of the tape section to be replaced).
7. Press the PAUSE/STILL button at the edit-out point.
8. Press the COUNTER RESET button.
   - ●The tape counter will be reset to "0000".
9. Press the REW button to determine the edit-in point (the beginning of the tape section to be replaced).
10. Press the PAUSE/STILL button at the edit-in point.
11. Press the INSERT button.
    - ●This engages the Insert Standby mode in which the input signal can be monitored on the TV screen; the still picture changes into the input signal that you are going to record.
    - ●The input sound signal can also be monitored.
12. Operate the source equipment properly.
    - ●Play back on another recorder the tape program to be inserted.
    - ●Select the channel to be recorded.
    - ●*Select the channel and set the FM tuner.*
13. Press the PLAY/X2 button to start insert editing.
    - ●Now video and audio signals will be recorded simultaneously.
    - ●At the counter reading of "0000", recording will stop automatically.
    - ●The tape will continue running in the Play mode.

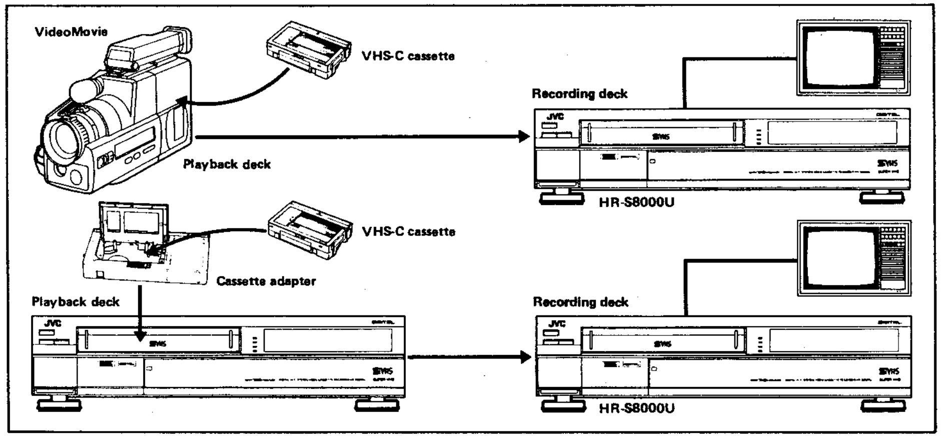
Notes:

- Do not use the STOP button to stop insert editing. If you press the STOP button, the tape stops and the Insert Edit mode is cancelled.
- If you wish to stop insert editing before the specified edit-out point is reached, press the COUNTER RESET button. Then the Play mode will be entered.
- The recording mode (SP or EP) is automatically determined by the previous recording on which the new segment is inserted regardless of the setting of the SP/EP switch.
- If the edit start point of the new scene lies in the SP mode and the edit end point of the same scene lies in the EP mode or vice versa, the inserted picture will distort at the switching point in the recording mode.
- If there is a non-recorded section on the tape, the Insert Edit mode will be cancelled automatically and the Play mode will be engaged.
- Insert editing is not possible with non-recorded cassettes or cassettes whose safety tab has been removed.

TAPE-TO-TAPE EDITING

VideoMovie recordings can be edited by using a VideoMovie camcorder (with playback facility) or a 2nd video deck.

Through use of a cassette adapter, VideoMovie recordings can be treated just like regular VHS cassettes.



- Connect the playback deck's VIDEO OUT and AUDIO OUT connectors (or the VideoMovie's AV OUT) to the recording deck's VIDEO IN and AUDIO IN connectors.
- Set the recording deck's SOURCE SELECT switch to AUX.
- Set the recording deck's S-VHS button as required.
- Put the playback deck in the Play mode.
- Put the recording deck in the Record mode.

Notes:

- For S-VHS editing, also refer to page 12.
- For monaural audio connection, use the AUDIO IN L connector.

Tips for obtaining better results
The quality of the edited tape may vary depending on the position of the EDIT switch. It is recommended that you first make some trial recordings.

- With the EDIT switch of the playback deck set to ON and recording deck to OFF,
- With the EDIT switch of both playback and recording decks set to ON, and
- With the EDIT switch of both decks set to OFF.

Choose the setting combination that best suits your preference.
Note: Also refer to the instruction manual of the 2nd video recorder you are using.

RECORDING WITH A VIDEO CAMERA

Connection
To connect a video camera, an appropriate camera adapter is necessary.

- Connect the video camera to the camera adapter.
- Connect the camera adapter to the HR-S8000U:
  adapter's VIDEO OUT to recorder's VIDEO IN,
  adapter's AUDIO OUT to recorder's AUDIO IN, and
  adapter's PAUSE to recorder's REMOTE PAUSE.

For proper connection of a camera to the HR-S8000U, consult a JVC dealer.

Operation

1. Turn the power on for all connected equipment.
2. Adjust the TV receiver to your video channel.
3. Load a cassette.
4. Set the SOURCE SELECT switch to AUX and the S-VHS button as required.
5. Press the TV/VIDEO button to obtain the VIDEO indication on the FDP.
6. Set the SP/EP button as required.
7. Press the REC/ITR and then the PAUSE/STILL button.
   - ●The recorder enters the Recording Standby mode.
8. Operate the camera's start/stop switch.
   - ●Recording starts and stops with this switch.
9. To end the recording, press the STOP button.

Notes:

- If feedback noise (whistling or howling) is heard from the TV receiver, reduce the volume or move the camera's microphone farther away from the TV receiver.
- For camera operation refer to the instruction manual for the relevant camera.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . .

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	• Is the power cord disconnected? – Connect it.
Clock is functioning properly, but the recorder cannot be powered.	• Is the TIMER indicator lit on the FDP? – Press the TIMER button to turn off the indicator.
Tape does not run during recording.	• Is the PAUSE/STILL button pressed to ON? – Press the PLAY/X2 button.
Tape stops in the Rewind of Fast Forward mode.	• Is the COUNTER MEMORY function engaged? – Set it to OFF.
Tape will not rewind or fast forward.	• Is the tape already fully rewound or fast forwarded? – Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	• Is a cassette loaded? • Is the safety tab on the cassette removed? – Reseal the slot with cellophane tape.
TV broadcasts cannot be recorded.	• Is the SOURCE SELECT switch set to AUX or SIMUL? – Set it to TUNER.
Camera recording is not possible.	• Are the camera and the camera adapter correctly connected? • Is the power switch of the camera adapter set to ON? • Is the SOURCE SELECT switch set to a position other than AUX? – Set it to AUX.
Simulcast recording is not possible.	• Is the SOURCE SELECT switch set to a position other than SIMUL? – Set it to SIMUL. • Is an audio source correctly connected to the AUDIO IN connectors? – Check connections.
Timer recording is not possible.	• Have you set the clock correctly and programmed the timer correctly? – Check once again. • Is the TIMER indicator lit on the FDP? – If not, press the TIMER button to light the indicator.

HI-FI AUDIO PROBLEMS

Symptoms	Check points
TV sound cannot be recorded on hi-fi audio tracks.	• Is the SOURCE SELECT switch set to SIMUL? – Set it to TUNER.
Breaks are noticeable in hi-fi audio reproduction.	• Adjust with the TRACKING control buttons. (See page 20.)
Soundtrack on the hi-fi audio track cannot be reproduced.	• Is the AUDIO MONITOR select button set to NORMAL? – Set it to Hi-Fi.
Audio level indicators do not function.	• Is the LEVEL INDICATOR switch set to OFF? – Set it to ON.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	• Is the TV receiver's channel selector set to the correct video channel? – Set it to the RF converter channel (3 or 4). (See page 14.)
Noise appears on the search and still pictures.	• This is normal.
Noise appears during normal playback.	• Adjust the TRACKING control buttons.
Playback picture is blurred or interrupted while TV broadcasts are clear.	• Video heads may be dirty. – Head cleaning is necessary. Consult your nearest JVC dealer.

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV during camera recording.	• Move camera's microphone away from TV or reduce TV sound volume.
Clock setting is not possible.	• Is the TIMER indicator lit on the FDP? – Press the TIMER button to turn off the indicator.
Some channels are skipped over when scanning channels.	• Those channels are preset to be skipped over. If you need them, restore them. (See page 16.)
Channel cannot be switched.	• Is recording in progress? – Press the PAUSE/STILL button, select a desired channel and press the PLAY/X2 button.
Snowy picture on screen when viewing TV programs while recording another program.	• Is the VIDEO indicator lit? – Press the TV/VIDEO button so that the indicator extinguishes.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. After a few minutes, plug it in-again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV program received is clear. This does not mean that the recorded program has been erased.
- Dirt accumulated on the video heads after long periods of use causes such troubles. In this case, head cleaning requiring highly technical care is necessary.

* For head cleaning, consult the nearest JVC dealer.

SPECIFICATIONS

Format : S-VHS/VHS NTSC standard with Hi-Fi audio
Video recording system : Rotary, two-head helical scan system with slant double-azimuth combination video heads
Hi-Fi audio recording system : Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels : 2 Hi-Fi audio channels
1 normal audio channel
Video signal system : NTSC-type color signal and separated Y/C signals conforming to NTSC.
Tape width : 12.65 mm (1/2 inch)
Tape speed
(SP) : 33.35 mm/s (1-5/16 ips)
(EP) : 11.12 mm/s (7/16 ips)
Maximum recording time
(SP) : 160 min. with T-160 video cassette
(EP) : 480 min. with T-160 video cassette
Temperature
Operating : 5°C to 40°C (41°F to 104°F)
Storage : -20°C to 60°C (-4°F to 140°F)
Antenna : 75 ohms, unbalanced
Channel coverage
(VHF) : Channels 2 – 13
(UHF) : Channels 14 – 69
(CATV) : 113 channels
RF output signal : Channel 3 or 4 (switchable; preset to channel 3 when shipped)
75 ohms, unbalanced
Power requirement : AC 120 V∿, 60 Hz
Power consumption : 48 W

Video
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 45 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at center position
Horizontal resolution : More than 400 lines (S-VHS)/ 240 lines (VHS) with PICTURE SHARPNESS control at center position

Audio
Input : -8 dBs, more than 50 k-ohms, unbalanced
Output level : -6 dBs, high impedance load
Output impedance : Less than 1 k-ohm, unbalanced
Signal-to-noise ratio : More than 40 dB (Normal audio)
Frequency range : 70 Hz to 10,000 Hz (Normal audio)

Hi-Fi audio
Frequency response : 20 Hz to 20,000 Hz
Dynamic range : More than 90 dB
Wow and flutter : Less than 0.005 % WRMS
Timer : 14-day programmable timer
8 programs with repeat function
Dimensions : 467 mm(W) x 107 mm(H) x 373 mm(D)
(18-7/16" x 4-1/4" x 14-11/16")
Weight : 8.4 kg (18.6 lbs)
Provided accessories : Infrared remote control unit
"AA"-size battery x 2
S-VIDEO cable (4-pin)
Matching transformer
Antenna extension cable
Antenna splitter
Antenna cable (F-type)
Audio cable
Video cable
S-VHS cassette tape

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

SECTION 1
MECHANISM ADJUSTMENT

1.1 GENERAL

1.1.1 Precautions

IMPORTANT:

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.
4. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the tape guides and rotary video head drum.)
5. For service procedures that call for operation of the set when the cassette housing is separated from the main-deck, perform as below.

1) Set a sheet of insulated material on the right of the chassis.
2) Remove the cassette housing from the main-deck and place it on the insulated sheet, but do not disconnect the connector from the MECHACON board.
3) Insert a cassette into the cassette housing. The housing mechanism functions to retract the cassette.
4) Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
5) The desired modes can be obtained by using the operation switches.

1.1.2 Required test equipment, fixtures and tools

For proper mechanical adjustment, the following test equipment, fixtures and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools are required.

1. Test equipment required:
   Color television or monitor
   Oscilloscope: Wide-band, dual trace, triggered, delayed sweep
   Recording tape
   Alignment tapes

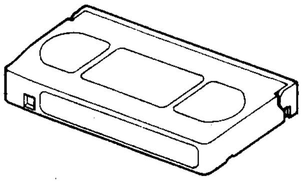
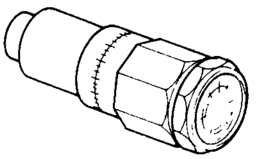
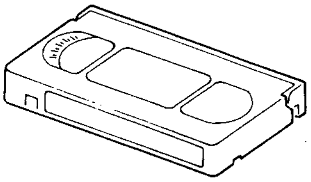
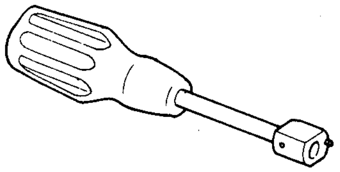
Alignment tape MH-1, MH-1L, MH-F1 	Torque gauge assembly PUJ48075-2 	Back tension cassette gauge PUJ48076-2 
A/CTL head position tool PUJ47351-2 		

Table 1-1-1 Fixtures and tools

1.1.3 Disassembly

1. Top cover
1) Take out four screws from the right and left sides of the side panel assembly (L) and (R).
2) Take out one screw from the rear side of the set.
3) Tilt up the rear end of the top cover, then remove it.

2. Front panel
1) Remove the top cover.
2) Bend three upper hooks of the front panel assembly upward to disengage them from their chassis retainers.
3) Disengage three lower hooks of the front panel assembly from their chassis retainers in order to remove the front panel assembly.

3. Bottom cover
1) Take out four screws and four feet from the bottom side of the set.
2) Take out three screws from the bottom side of the set.
3) Set free the bottom cover from its six retainers of the chassis in order to remove the bottom cover.

4. Cassette housing door
1) Remove the front panel assembly.
2) Bend center of the cassette housing door toward you, then pull out the right end from the cassette housing.
3) Use care regarding the torsion spring, then pull out the left end of the cassette housing door to remove it.

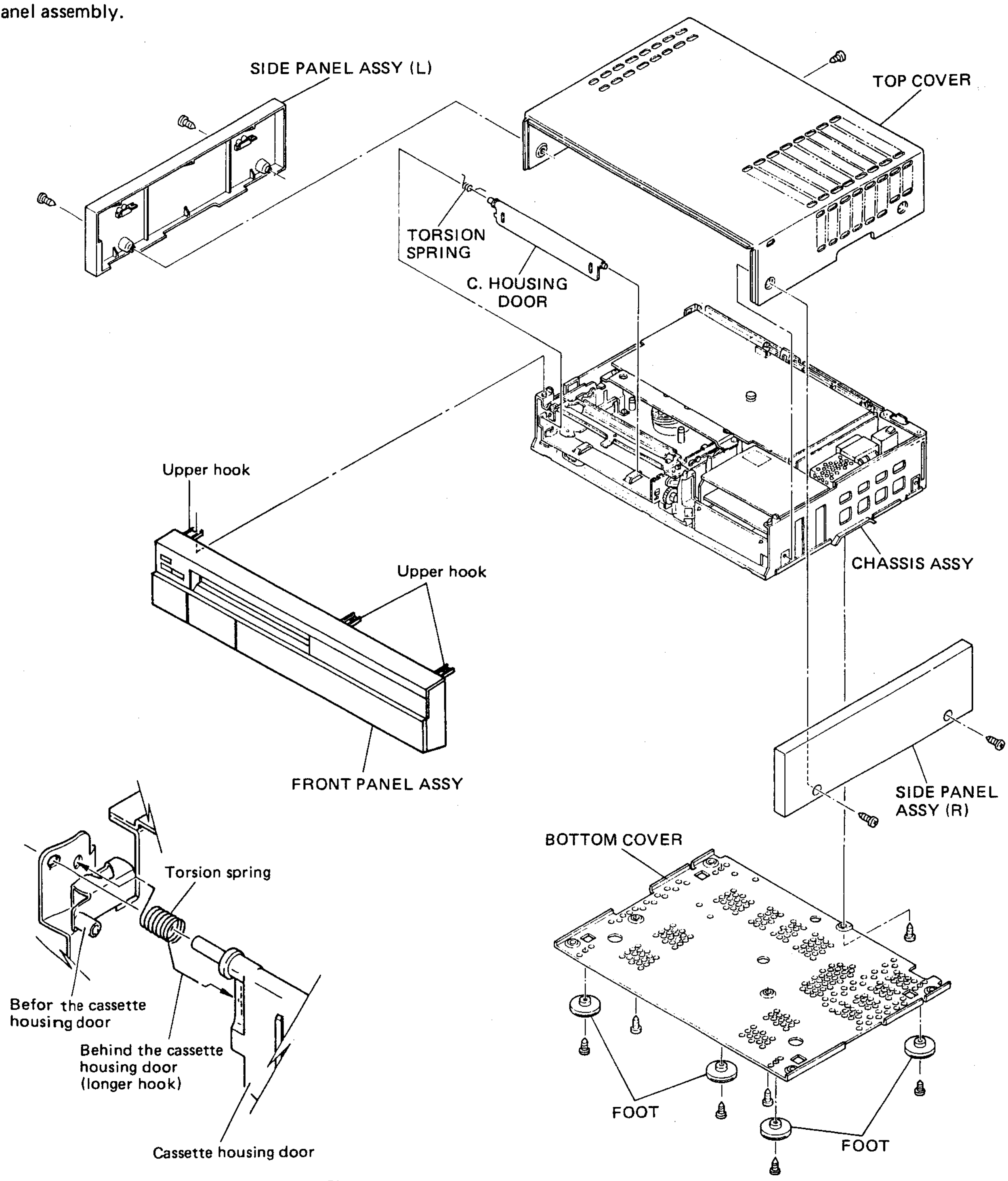

SIDE PANEL ASSY (L)
TOP COVER
TORSION SPRING
C. HOUSING DOOR
Upper hook
Upper hook
CHASSIS ASSY
FRONT PANEL ASSY
SIDE PANEL ASSY (R)
BOTTOM COVER
Torsion spring
Befor the cassette housing door
Behind the cassette housing door (longer hook)
Cassette housing door
FOOT
FOOT

Fig. 1-1-1 Removal of external covers

1.1.4 Layout of main parts

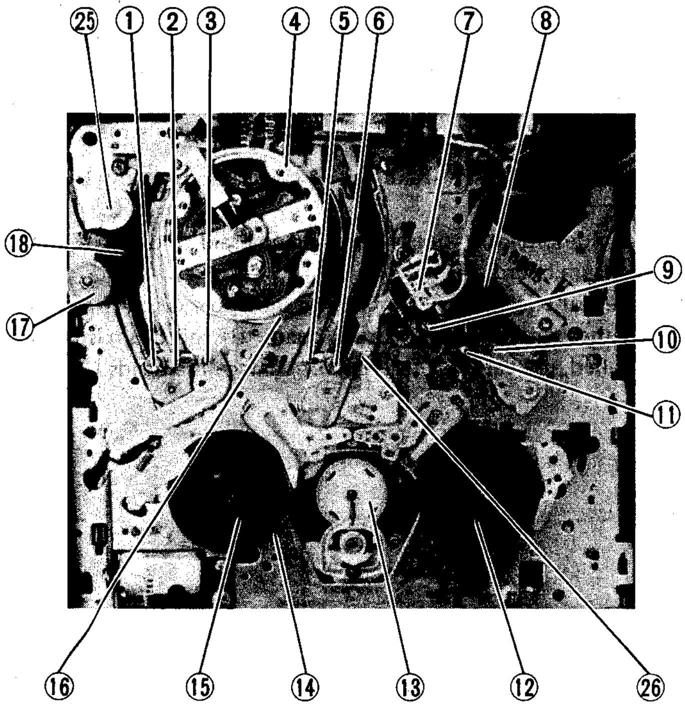


Fig. 1-1-2 Top view of main-deck

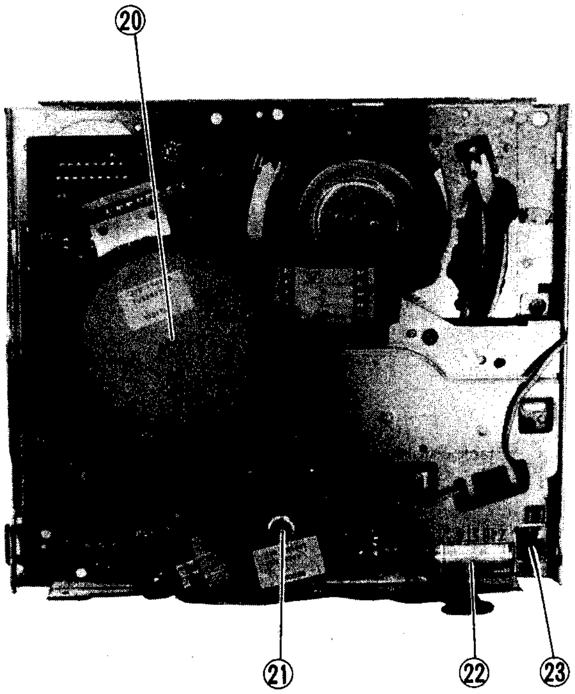


Fig. 1-1-3 Bottom view of main-deck

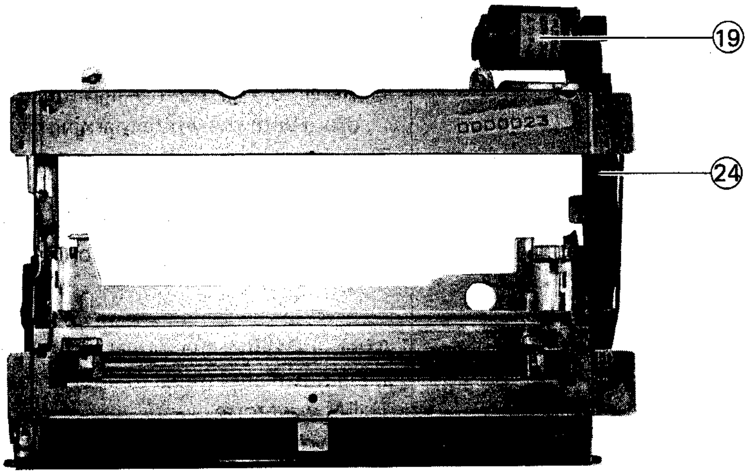
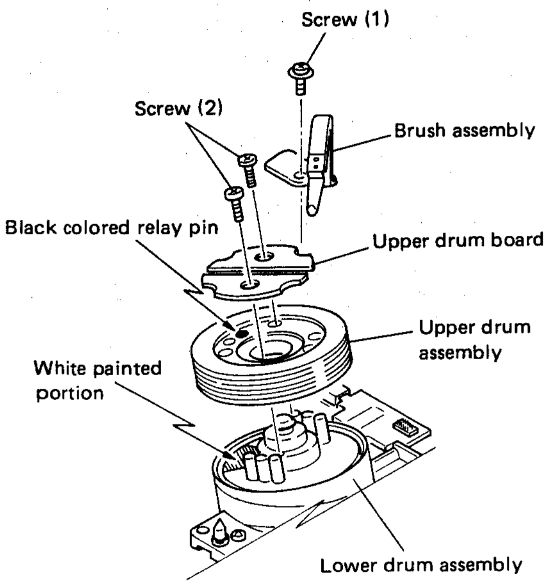
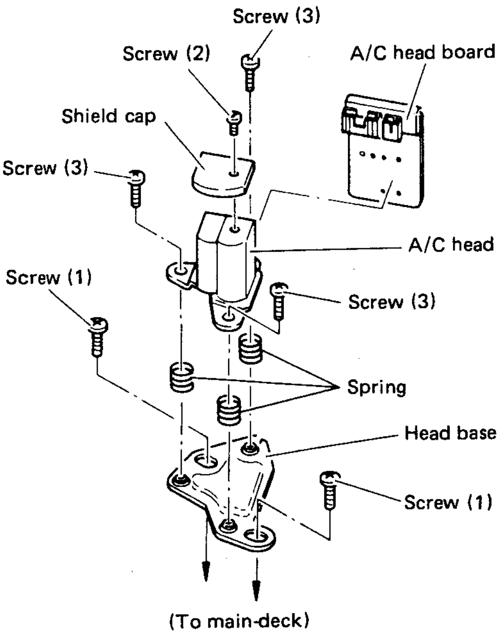
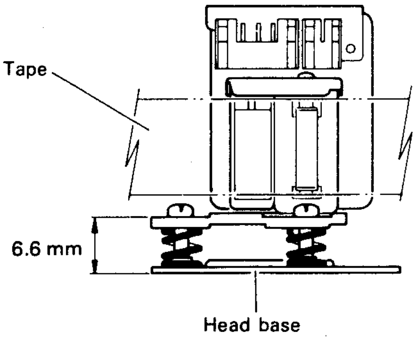


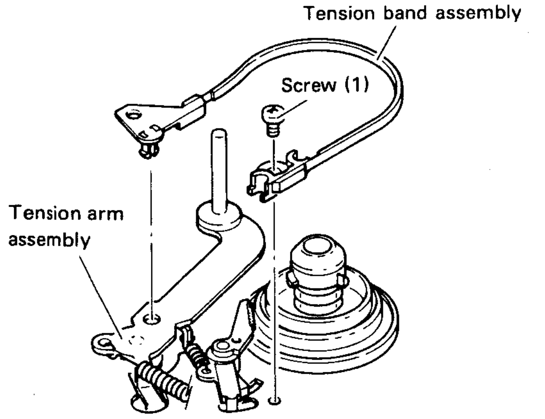
Fig. 1-1-4 Cassette housing

1. Supply guide roller
2. Supply slant pole
3. Tension pole
4. Upper drum
5. Take-up slant pole
6. Take-up guide roller
7. A/C head
8. Pinch roller
9. Take-up guide pole
10. Guide arm
11. Capstan
12. Take-up reel disk
13. Reel idler
14. Tension band
15. Supply reel disk
16. Lower drum
17. Impedance roller
18. Full erase head
19. Cassette motor
20. Capstan motor
21. Reel motor
22. Mode motor
23. Mode belt
24. Cassette belt
25. Roller
26. Half loading arm

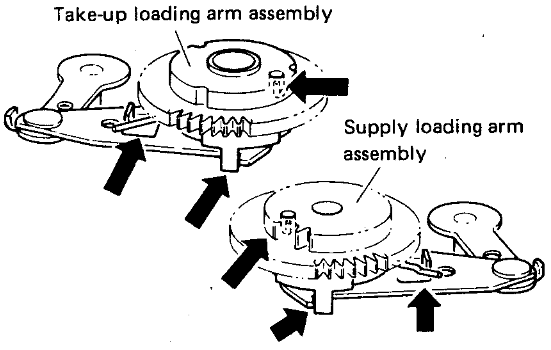
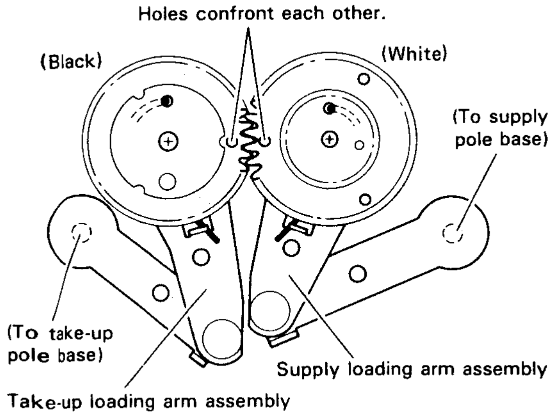
1.2 MAIN ASSEMBLY REPLACEMENT

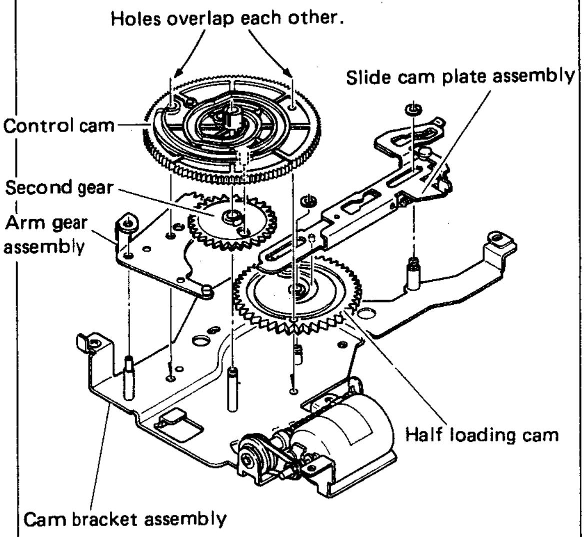
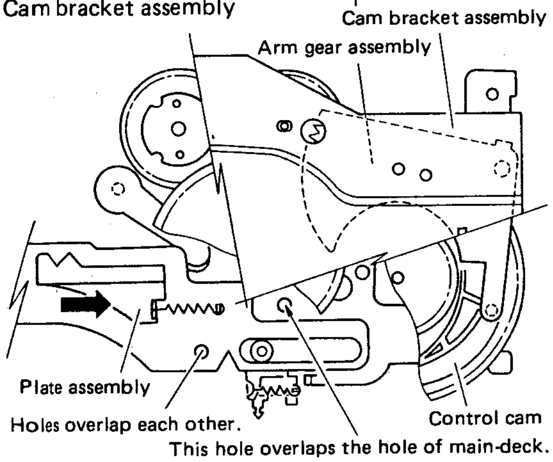
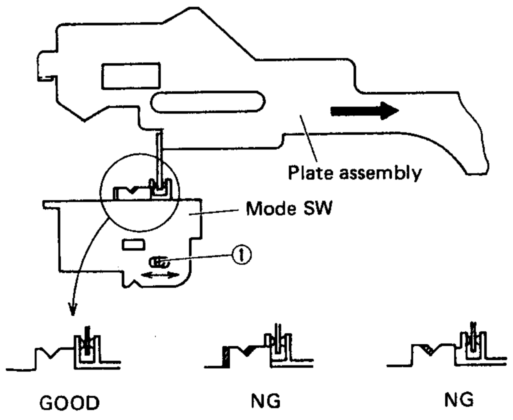
No.	Item	Adjustment parts	Operating mode	Description
1	Upper drum assembly			**Note:** When installing the new upper drum, use care not to touch the video heads. If heads are soiled, clean with a soft, finely woven cotton cloth or chamois that has been moistened in alcohol. Hold lightly against the heads and turn the drum clockwise. By no means clean with a vertical stroke.
	– Removal –  Screw (1) Screw (2) Brush assembly Black colored relay pin Upper drum board Upper drum assembly White painted portion Lower drum assembly **Fig. 1-2-1** Upper drum assembly			1) Refer to Fig. 1-2-1. Take out screw (1) and remove the brush assembly. 2) Use a desoldering tool or desoldering braid to unsolder the upper drum boards. 3) Take out two screws (2) and raise the upper drum to remove it together with the upper drum board. (If this drum is to be reinstalled, use care not to touch or damage the heads.)
	– Installation –			1) Refer to Fig. 1-2-1. Align the black relay pin of the new upper drum with the white marking of the lower drum. 2) Reinsert screws (2) and tighten them in a balanced manner. 3) Reinstall and solder the upper drum boards. 4) Clean the drum assemblies (see above note). 5) Reinstall the brush assembly and secure with screw (1).
	– Checks and adjustments –			After installing the upper drum, perform the following checks and adjustments (refer to appropriate Sections of this Manual). 1) FM waveform 2) Servo circuit 3) Video circuit 4) FM audio circuit

No.	Item	Adjustment parts	Operating mode	Description
2	A/C head (Audio/Control head)			
	— Removal —  Screw (3) Screw (2) A/C head board Shield cap Screw (3) A/C head Screw (1) Screw (3) Spring Head base Screw (1) (To main-deck) **Fig. 1-2-2** A/C head			1) Disengage connectors attached to the A/C head board. 2) Take out two screws (1) and remove the A/C head together with the head base. 3) Unsolder and remove the A/C head board from the A/C head. 4) Take out screw (2) and remove the shield cap from the A/C head. 5) Take out three screws (3) and remove the A/C head from the head base. Use care regarding the three springs.
	— Installation —  Tape 6.6 mm Head base **Fig. 1-2-3** A/C head height			1) Install the A/C head by reversing the removal steps of above. 2) Temporarily set the A/C head height above the head base for 6.6 mm (see Fig. 1-2-3).
	— Checks and adjustments —			1) Use a spare tape (not Alignment tape) and confirm proper operation of the tape transport (see Section 1.5). 2) Perform interchangeability adjustment (see Section 1.6).

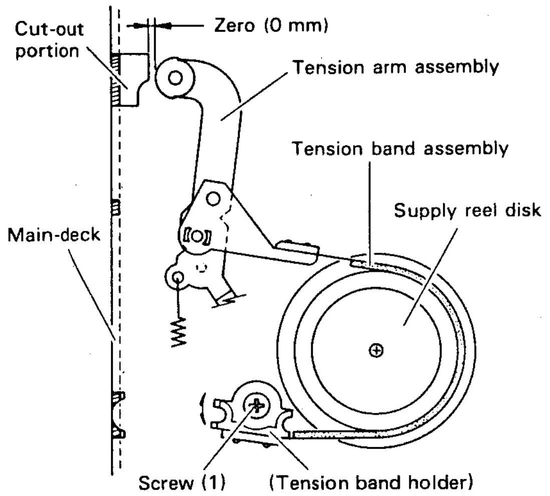
No.	Item	Adjustment parts	Operating mode	Description
3	Tension band assembly  Tension band assembly Screw (1) Tension arm assembly **Fig. 1-2-4** Tension band assembly			1) Take out screw (1) and disengage the tension band assembly from the tension arm assembly (see Fig. 1-2-4). 2) Remove and replace the tension band assembly. 3) Perform tension pole position adjustment (see Section 1.4).

1.3 ASSEMBLY PROCEDURE OF MECHANISM

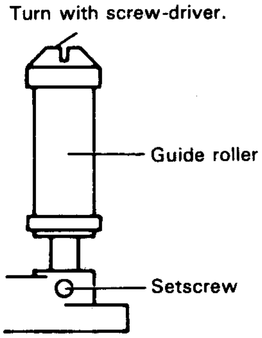
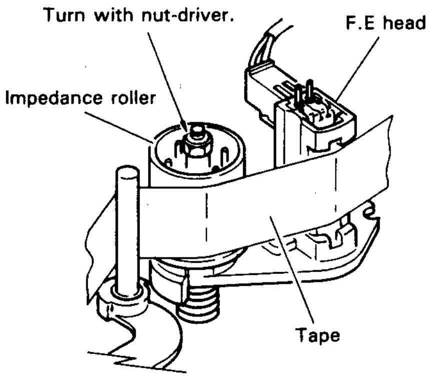
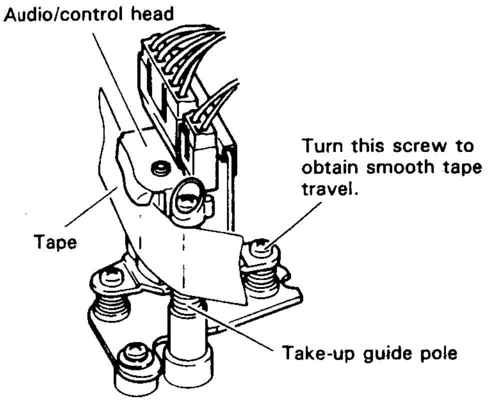
No.	Item	Adjustment parts	Operating mode	Description
	A close relationship exists between the mode select switch and the mechacon circuit. Therefore, the mode select switch and control arm engagement determines the overall mechanical operations of the levers, gears, rollers, etc. If these parts are not properly positioned, the video deck becomes stalled in the unloading or Stop mode.			
1	Loading arm assemblies  Take-up loading arm assembly Supply loading arm assembly **Fig. 1-3-1** Loading arm assembly (1)  Holes confront each other. (Black) (White) (To supply pole base) (To take-up pole base) Supply loading arm assembly Take-up loading arm assembly **Fig. 1-3-2** Loading arm assembly (2)			These assemblies are comprised of loading gears, torsion springs and loading arms. 1) Refer to Fig. 1-3-1 and install the loading arm assemblies correctly. 2) The take-up and supply loading arm positions with respect to the loading gear holes are indicated in Fig. 1-3-2. This configuration is important to allow shifting to the next operation.

No.	Item	Adjustment parts	Operating mode	Description
2	Control cam  Holes overlap each other. Slide cam plate assembly Control cam Second gear Arm gear assembly Half loading cam Cam bracket assembly **Fig. 1-3-3** Control cam			1) Install the half loading cam on the cam bracket assembly, then mount the slide cam plate assembly so that its stud sets into the groove on the half loading cam. 2) Install the arm gear assembly on the cam bracket assembly. 3) Assemble the second gear and the control cam so that the stud of the control cam sets into the hole of the second gear. 4) Mount the above assembly (control cam and second gear) on the cam bracket assembly to satisfy the relation indicated in figure. 5) Do not turn the control cam from this position for the next step.
3	Cam bracket assembly  Cam bracket assembly Arm gear assembly Plate assembly Holes overlap each other. Control cam This hole overlaps the hole of main-deck. **Fig. 1-3-4** Cam bracket assembly			1) Refer to Fig. 1-3-4 and press the plate assembly toward the right to overlap the indicated hole with that of the main deck. 2) Then install the cam bracket assembly. **Note:** If the arm and loading gears do not mesh properly, use a jeweler's screwdriver or similar tool to engage the gear teeth while installing the cam bracket assembly.
4	Mode switch position  Plate assembly Mode SW ① GOOD NG NG **Fig. 1-3-5** Mode switch			1) Engage the plate assembly and mode switch as shown in Fig. 1-3-5. Partially tighten screw (1) to where the switch can still be shifted for adjusting the position. 2) Press the plate assembly toward the right to where the holes are overlapped as in Fig. 1-3-4. Insert a jeweler's screwdriver into the holes to keep them aligned. 3) Shift the mode switch to align the V-notch as indicated in Fig. 1-3-5. Then tighten screw (1) to secure. 4) Remove the jeweler's screwdriver, then reinstall and solder the circuit board.

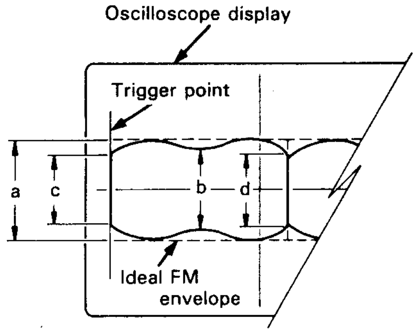
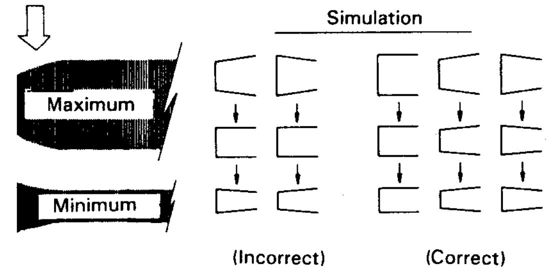
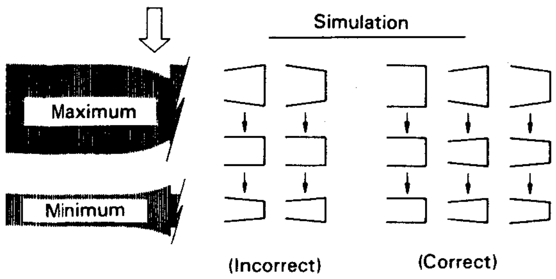
1.4 CONFIRMATION AND ADJUSTMENT

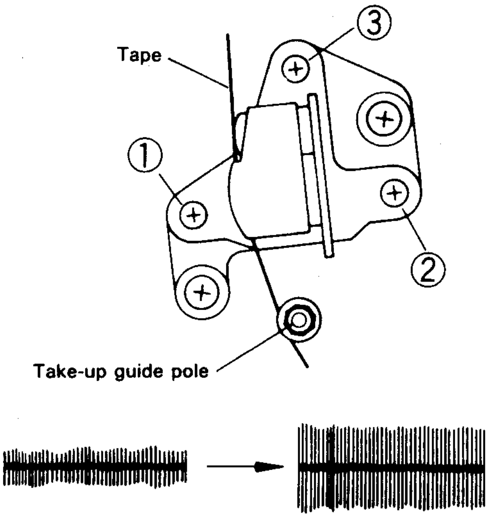
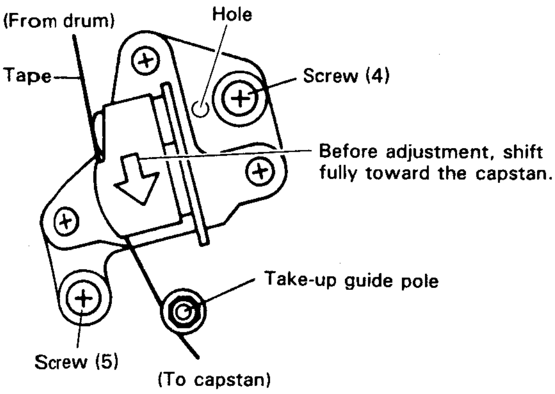
No.	Item	Adjustment parts	Operating mode	Description
1	Tension pole position  Cut-out portion Zero (0 mm) Tension arm assembly Tension band assembly Supply reel disk Main-deck Screw (1) (Tension band holder) **Fig. 1-4-1** Tension pole position			1) Without a cassette tape, set for the Play mode (see Section 1.1). 2) Refer to Fig. 1-4-1. Slightly loosen screw (1). Adjust the tension band holder position for 0 mm separation between the tension arm and cutout position. 3) Tighten screw (1) to secure the tension band holder. 4) Use the back tension cassette gauge and set for the Play mode. 5) Check for a scale reading between 25 and 75. 6) If outside this range, clean the tension band contacting portions of the supply reel disk with alcohol, or check the condition of the tension arm spring. If necessary, replace the tension band assembly.
2	Take-up torque			1) Without a cassette tape, set for the Play mode (see Section 1.1). 2) Set the torque gauge on the take-up reel disk. 3) Grasp the torque gauge lightly so that it rotates and read the value when the scale matches the indicator needle. Confirm a value between 45 and 155. 4) If outside this range, clean the rubber portion of the idler arm with alcohol, or if necessary, check the reel motor drive circuit.

1.5 TAPE TRANSPORT CHECKS AND ADJUSTMENT PREPARATIONS

No.	Item	Adjustment parts	Operating mode	Description
	The tape transport system has been precision-adjusted at the factory and ordinarily does not require readjustment. However, adjustment may become necessary after long term usage or after replacing parts that affect the tape transport. The following steps mainly cover preparations for the interchangeability adjustments of Section 1.6.			
1	Guide roller  Turn with screw-driver. Guide roller Setscrew **Fig. 1-5-1** Guide roller			1) During interchangeability adjustments, the guide roller is turned with a flat-blade screwdriver to adjust its height and correct FM waveform linearity. Use a metric hex key (1.25 mm) to slightly loosen the setscrew at the base of the guide roller (see Fig. 1-5-1). Loosen the setscrew just sufficiently to allow the guide roller to be turned. If too loose, tape transport will be too unstable to permit correct adjustment.
2	Impedance roller  Turn with nut-driver. F.E head Impedance roller Tape **Fig. 1-5-2** Impedance roller			1) This compensates for tape running stability between the cassette and head drum. After adjusting the supply guide roller, the impedance roller height is adjusted for smooth tape transport at the lower flange. 2) Use a metric nutdriver (5.5 mm) to adjust by turning the upper nut (see Fig. 1-5-2). However, note that excess turning can disturb the FM waveform stability.
3	A/C head (audio/control head)  Audio/control head Turn this screw to obtain smooth tape travel. Tape Take-up guide pole **Fig. 1-5-3** A/C head			1) After adjusting the take-up guide roller, adjust the A/C head inclination for smooth tape travel at the lower flange of the take-up guide pole. Refer to Fig. 1-5-3.

1.6 INTERCHANGEABILITY CHECKS AND ADJUSTMENTS

No.	Item	Adjustment parts	Operating mode	Description
	Before using costly Alignment tape, use a spare tape and confirm correct operation of the tape transport.			
1	FM waveform $\frac{b}{a} \geqq 0.7$, $\frac{c}{a} \geqq 0.5$ and $\frac{d}{a} \geqq 0.5$  Oscilloscope display Trigger point a c b d Ideal FM envelope **Fig. 1-6-1** FM envelope  Drum entrance Simulation Maximum Minimum (Incorrect) (Correct) **Fig. 1-6-2** Drum entrance  Drum exit Simulation Maximum Minimum (Incorrect) (Correct) **Fig. 1-6-3** Drum exit			1) Connect oscilloscope to the FM OUT testpoint of the video playback circuit. Trigger the oscilloscope externally with the signal from the drum flipflop (D-FF or FF) testpoint. Set the trigger slope to minus (–). 2) Play the MH-1 Alignment tape and adjust the tracking for maximum FM waveform output. Refer to Fig. 1-6-1. Confirm the relationships indicated in the figure for maximum output (a), minimum center output (b), minimum output at the drum intake (c) and minimum output at the drum output (d). 3) Adjustment is required if the above specifications are not fulfilled. Even when these are fulfilled, check that the FM waveform varies linearly overall. If not, slight deviation in tracking will cause a large proportional level drop to result in noise appearing in the picture. Therefore, in this condition, proceed to the following checks and perform adjustments where necessary. 4) Operate the tracking adjustment between minimum and maximum outputs of the FM waveform. Observe the portion of the waveform corresponding to the drum intake (see Fig. 1-6-2). As the tracking is adjusted, although the gain may increase or decrease, the geometric shape of this part of the waveform should remain consistent. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the supply guide roller height. 5) Next observe the portion of the waveform corresponding to the drum output (see Fig. 1-6-3), while operating the tracking adjustment. This should also vary only in gain, but not in shape. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the take-up guide roller height. 6) Check the overall FM waveform. Fine-adjust both guide rollers so that variation is as minimum and linear as possible. 7) Observe the tape travel at the guide rollers and guide poles. Confirm absence of tape creasing or curling. Confirm that the tape properly rides at the lower flange of the supply guide pole. Carefully adjust the guide pole height if necessary. This adjustment is important and affects FM waveform response. If creasing or curling is observed at the take-up guide pole, carefully adjust the audio/control head inclination so that the tape rides properly at the lower flange of the guide pole. Finally, again check the FM waveform.

No.	Item	Adjustment parts	Operating mode	Description
	Proper adjustment of the A/C head position is important for ensuring adequate audio output and S/N. Severe misalignment can prevent control signal pick-up and cause servo instability. Precise adjustment is particularly important for models that include tape indexing and addressing features, since these rely on control signal coding for operation. To observe the audio signal, connect an oscilloscope to the test point (AUDIO OUT) of the audio circuit, or directly to the audio output terminal. In some cases, monitoring the sound with headphones may be helpful.			
2	A/C head adjustments  **Fig. 1-6-4** A/C head			1) Play the stairstep (audio 7 kHz) portion of the MH-1 Alignment tape. 2) Adjust screw (3) (Fig. 1-6-4), which is the azimuth adjustment, for maximum output. 3) Turn screws (1), (2) and (3) by small and equal increments (about 45° at a time) to adjust the A/C head height for maximum audio output. Slightly raise and lower the height to confirm the maximum output position. 4) Observe the FM waveform and tighten the guide roller setscrews. Use care not to disturb the height adjustments. Then again confirm the FM waveform.
	This determines the distance between the sound and picture information on the tape. Correct adjustment is important for providing synchronization of picture and sound in the program. Incorrect adjustment is particularly noticeable in the slow speed (EP) mode. Observe the FM waveform by connecting an oscilloscope to the video play-back circuit test point (FM OUT). Trigger the oscilloscope externally with the drum flipflop signal. Use plus (+) trigger to view the CH-2 waveform. Set the tracking adjustment to the neutral (AUTO) position.			
3	Control head phase (X value)  (From drum) Hole Tape Screw (4) Before adjustment, shift fully toward the capstan. Take-up guide pole Screw (5) (To capstan) **Fig. 1-6-5** Control head phase			1) Play the stairstep portion of the MH-1 Alignment tape. 2) See Fig. 1-6-5. Slightly loosen screws (4) and (5). Set the A/C head positioning tool over screw (4) with the pin of the tool inserted into the indicated hole. 3) Turn the tool counterclockwise to shift the A/C head fully toward the capstan direction. 4) While observing the CH-2 FM waveform, gradually turn the tool clockwise. Stop at the peak output position and tighten screw (5). Remove the tool and tighten screw (4). 5) Replace alignment tape MH-1L with MH-1, play back the stairstep segment of the alignment tape MH-1L. 6) Operate the tracking adjustment and confirm that the maximum FM waveform is obtained at the neutral setting. 7) If the FM output peak is not obtained at tracking neutral position, shift the A/C head at the FM output peak nearest to this position.

No.	Item	Adjustment parts	Operating mode	Description
4	Final checks			1) Supply a video or TV signal (monochrome is preferable). Use a spare tape and record and play back. Confirm that the play-back FM signal conforms to the parameters indicated in Fig. 1-6-1. Check for both SP and EP modes. 2) Connect the oscilloscope to the test point (FM OUT) of the FM audio play-back circuit. Play the stairstep portion (which includes the FM audio carrier) of the MH-1L Alignment tape. Confirm absence of severe drop in FM waveform level. 3) Perform the checks and, if necessary adjustments, of the Electrical Adjustments Section for the servo, video and audio (and FM audio) circuits.

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio generator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: TV-channel
8. Signal generator: NTSC color bars, stairstep, video sweeper or multi-burst
9. Recording tape
10. Alignment tapes: MH-1, MH-1L, MH-1H, MH-F1
11. Patch cord: PTU94001 (PRE/REC board to CONNECTOR board)

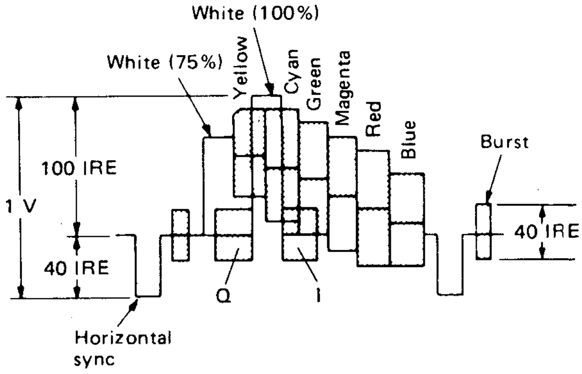

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
100 IRE
1 V
40 IRE
40 IRE
Q
I
Horizontal sync

Fig. 2-1-1 Color bars signal waveform

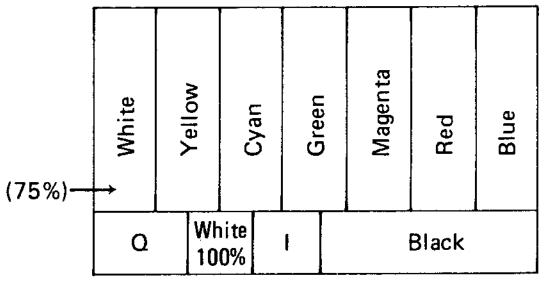

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
Q
White 100%
I
Black

Fig. 2-1-2 Color bars pattern

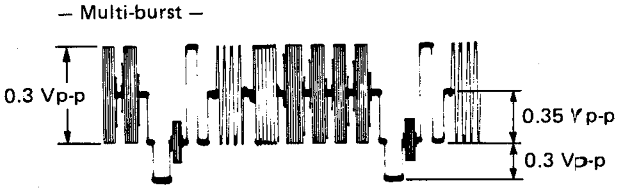

– Multi-burst –
0.3 Vp-p
0.35 Vp-p
0.3 Vp-p

Fig. 2-1-3 Input signal level for multi-burst

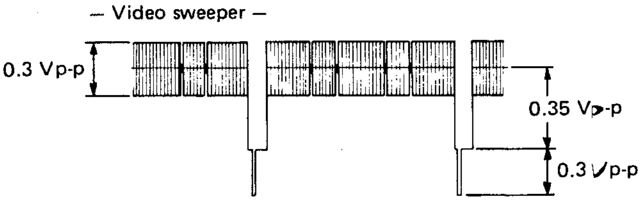

– Video sweeper –
0.3 Vp-p
0.35 Vp-p
0.3 Vp-p

Fig. 2-1-4 Input signal level for video sweeper

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (–) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.

Color bars	Color bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-1 color bars	Color bars segment of MH-1 alignment tape.
MH-1 stairstep	Stairstep segment of MH-1 alignment tape.
MH-1 1 kHz	1 kHz audio signal segment of MH-1 alignment tape.
MH-1 RF sweep	RF sweep segment of MH-1 alignment tape.
MH-1L color bars	Color bars segment of MH-1L alignment tape.
MH-1L stairstep	Stairstep segment of MH-1L alignment tape.
MH-1L RF sweep	RF sweep segment of MH-1L alignment tape.
MH-1M color bars	Color bars segment of MH-1M alignment tape.
MH-1M stairstep	Stairstep segment of MH-1M alignment tape.
MH-1H color bars	Color bars segment of MH-1H alignment tape.
MH-F1 stairstep	Stairstep segment of MH-F1 alignment tape.
MH-F1 1 kHz	1 kHz FM audio signal segment of MH-F1 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
A DUB	Audio dubbing mode
SP mode	SP recording speed
EP mode	EP recording speed
LP mode	LP recording speed
S-VHS mode (S mode)	Super-VHS recording mode

Description	This column provides an explanation of the step, notes and adjustment values.

2.2 SWITCHING REGULATOR CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the SWITCHING REGULATOR board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5 V DC output voltage	CN6-1	R29	• REC • SOURCE SEL: TUNER	1. Connect a digital voltmeter between CN6-1 and TP-GND. 2. Record in the TUNER mode, adjust R29 for 5.34 ± 0.05 V.
2	SEMIREG 15 V output voltage	CN1-7	R100	• REC • SOURCE SEL: TUNER	1. Connect a digital voltmeter between CN1-7 and TP-GND. 2. Record in the TUNER mode, adjust R100 for 15.1 ± 0.1 V.

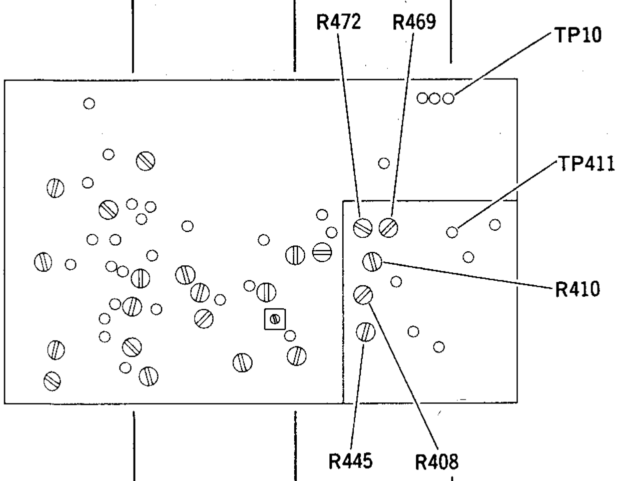
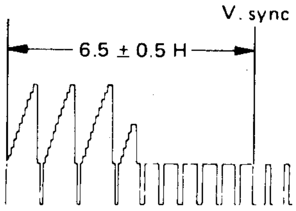
2.3 TIMER CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the TIMER board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Timer clock	TP2	C9	• E-E	1. Connect a frequency counter between TP2 and GND. 2. Short between GND and TP1 (TEST), then short the leads of electrolytic capacitor C5 once in order to reset IC1. 3. Adjust C9 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs).

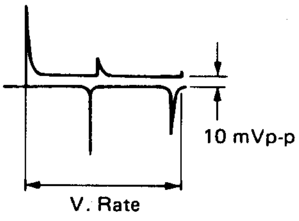
2.4 SERVO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

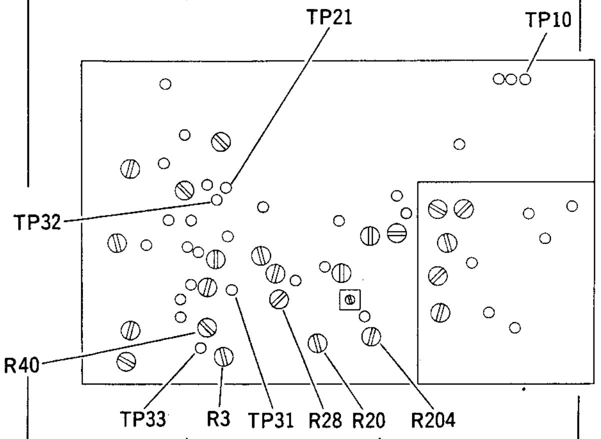
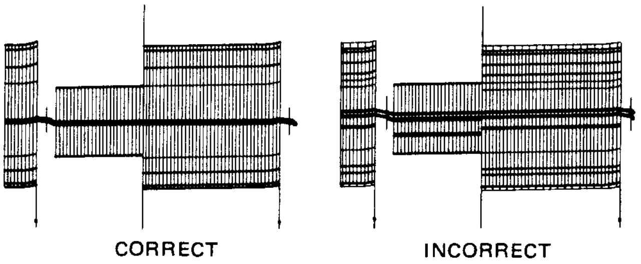
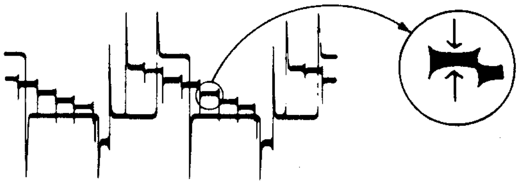
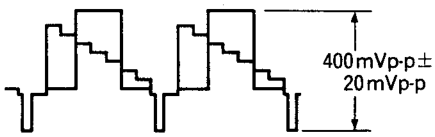
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	PB Switching Point	VIDEO OUT or TP10	R445 (CH-1) 	• PB • MH-1 Stairstep • Trigger slope (–) • SP mode	1. Connect an oscilloscope to VIDEO OUT or TP10 of the main board. 2. Play back the stairstep segment of MH-1 alignment tape. 3. Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF). 4. Adjust R445 to position the trigger point 6.5 ± 0.5H from V. sync.  **Fig. 2-2-1**
2	Slow Tracking	Monitor	R472	• Slow PB (1/6) • SP mode	**Note:** Slow motion will start automatically after pressing the search button. 1. Set the tracking control of the FRONT to the pre-set position by simultaneously pressing the + and – tracking buttons. 2. Record a color bar signal in the SP mode, then play back in the Slow mode. 3. Adjust R472 to minimize noise bars in the monitor-TV display.
3	2X normal Tracking	Monitor	R410	• 2X Play • SP mode	1. Set the tracking control of the FRONT panel to the pre-set position by simultaneously pressing the + and – tracking buttons. 2. Record a color bar signal in the SP mode, then playback in the 2X play mode. Adjust R410 to minimize noise bars in the monitor-TV display.
		Monitor	R408	• 2X Play • EP mode	3. In the same manner, adjust R408 for the EP mode.

2.5 VIDEO CIRCUIT

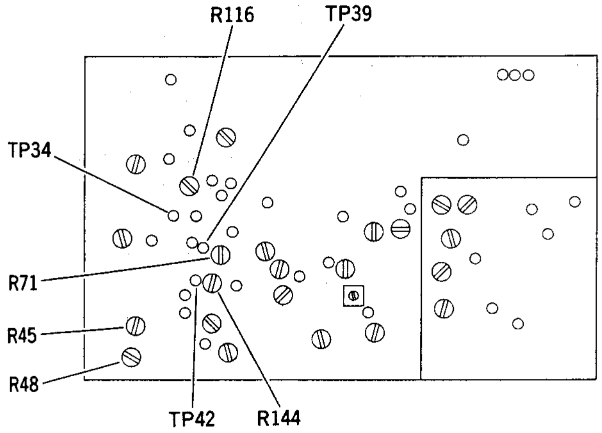
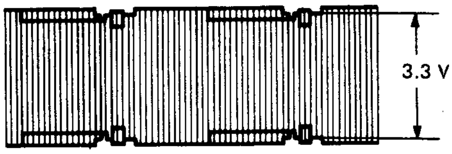
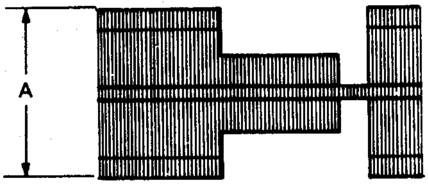
Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	E-E level	VIDEO OUT or TP10	R204	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to VIDEO OUT and supply a color bar signal to VIDEO IN. 2. Adjust R204 for 0.97 ± 0.03 Vp-p (75 Ω load).
2	CCD bias-1	TP31	R3	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	**Note:** Confirm that the video signal level is 0.97 ± 0.03 Vp-p (75 Ω load) at VIDEO OUT. If necessary, perform the "E-E level" adjustment (Section 2.5.1) before this adjustment. 1. Connect an oscilloscope to TP10 and supply a color bar signal to VIDEO IN. 2. Adjust R3 for maximum output level.
3	CCD bias-2	TP32	R20	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP32 and supply a color bar signal to VIDEO IN. 2. Adjust R20 for maximum output level.
4	Y NR (NCBAL)	TP21	R28	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Observe the TP21 waveform at V rate. 2. Adjust R28 for minimum DC step difference (less than 10 mVp-p)  Fig. 2-5-1

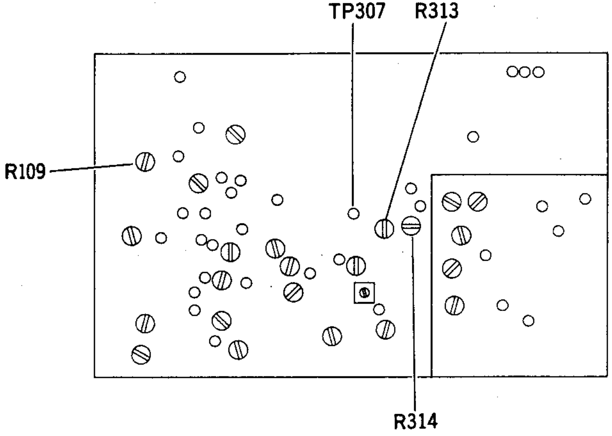
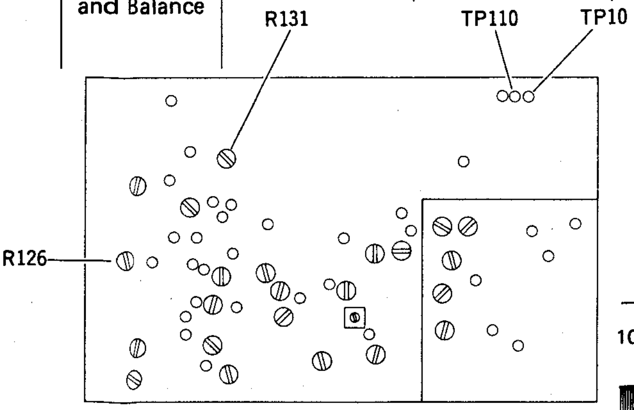
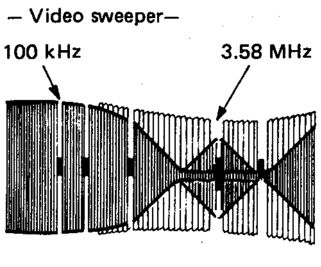
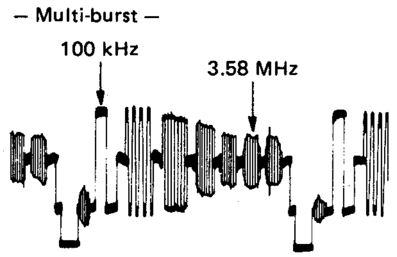
Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
5	COL COMB  TP21 TP10 TP32 R40 TP33 R3 TP31 R28 R20 R204	TP33	R40	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP33 and apply a color bar signal to VIDEO IN. 2. Adjust R40 so that the signal center-lines overlap each other (less than 50 mVp-p), in the SP mode.  **Fig. 2-5-2**
6	Y COMB1 and 2	TP34	R45 R48	• N mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP34 and supply a color bar signal to VIDEO IN. 2. Adjust R45 and R48 alternately for minimum chromatic level (less than 50 mVp-p of the magenta portion.  **Fig. 2-5-3**
7	PROCESSOR input level	TP39	R71	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP39 and apply a color bars signal to VIDEO IN. 2. Adjust R71 for 400 ± 20 mVp-p signal level, in the SP mode.  **Fig. 2-5-4**

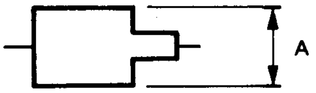
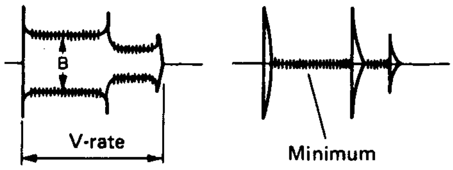
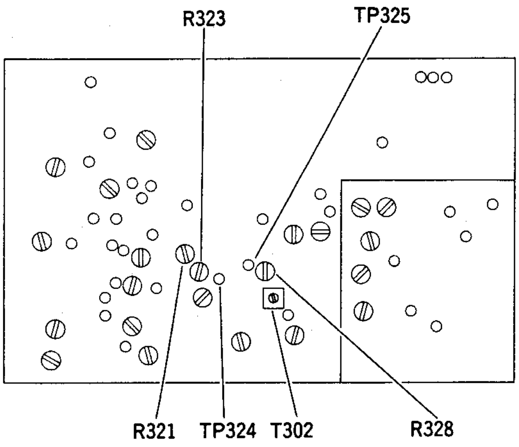
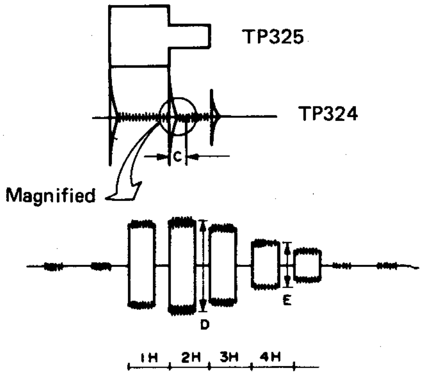
Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
8	S mode REC FM level	TP3 (PRE/REC)  	R116	• S-VHS mode • EP mode • REC • Color bars • SOURCE SEL: AUX	**Note:** Connect an oscilloscope GND terminal to TP-GND near the shield case of the PRE/REC board. 1. Connect an oscilloscope to TP3 of the PRE/REC board and record a color bars signal in the EP mode. 2. Adjust R116 for 3.3 ± 0.2 Vp-p pedestal level, between centers of the waveform outline at the pedestal portion.  **Fig. 2-5-5**
9	N mode REC FM level	TP3 (PRE/REC)	R109	• N mode • EP mode • REC • Color bars • SOURCE SEL: AUX	1. In the same manner as above (Sec. 2.5.8), adjust R109 for 1.9 ± 0.1 Vp-p pedestal level.
10	SP REC Color Level and Balance	TP307	R313  **Fig. 2-5-6**	• S-VHS mode • PB mode • MH-1H color bars • SP mode • REC then PB • Color bars • SP mode	**Note:** Use larger-level waveform for adjustment. 1. Connect an oscilloscope to TP307. Play back a color bar segment of the MH-1H and observe color signal level. 2. Adjust By pressing the + and – tracking buttons of the FRONT panel for maximum level of the color waveform and make a note of the higher color level "A". 3. Set the tracking control of the FRONT panel to the per-set position by simultaneously pressing the + and – tracking buttons. 4. Record and paly back a color bar signal. If necessary, before recording, adjust R313 so that the higher level channel becomes 95 to 105% of the noted level "A" during playback. At this time, confirm that the channel difference is within 4 dB.

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
11	EP REC Color Level and Balance	TP307	R314  	• S-VHS mode • PB mode • MH-1H color bar • REC then PB • Color bar • EP mode	**Note:** Perform the EP mode adjustment after completing the SP mode. 1. Connect an oscilloscope to TP307. Play back a color bar segment of the MH-1H and observe color signal level. 2. Adjust by pressing the + and – tracking buttons of the FRONT panel for maximum level of the color waveform and make a note of the higher color level "A". 3. Set the tracking control of the FRONT panel to the per-set position by simultaneously pressing the + and – tracking buttons. 4. Record and play back a color bar signal. If necessary, before recording, adjust R314 so that the higher level channel becomes 110 to 120% of the noted level "A" during playback. At this time, confirm that the channel difference is within 5 dB.
12	S mode PB Y level	VIDEO OUT or TP10	R126	• S-VHS mode • SP mode • REC then PB • Color bars	1. Connect an oscilloscope to VIDEO OUT. 2. Record a color bar signal in the SP mode, then play back. 3. Adjust R126 for 0.97 ± 0.03 Vp-p (75 Ω load).
13	N mode PB Y level	VIDEO OUT or TP10	R131	• N mode • SP mode • REC then • Color bars	1. In the same manner as above (Sec. 2.5.12), adjust R131 for 0.97 ± 0.03 Vp-p (75 Ω load).
14	S mode SP Frequency Response and Balance	TP110	R118 (PRE/REC)  	• S-VHS mode • SP mode • REC then PB • Multi-burst or video sweeper	1. Terminate TP110 at 75 Ω load and set sharpness control to center-detent position. 2. Connect a signal generator to VIDEO IN and an oscilloscope to TP110. 3. Record in the SP mode, then play back and set 100 kHz level to 3-scale on the oscilloscope display at CH1 waveform. 4. Adjust R118 (PRE/REC board) so that the 3.58 MHz level becomes 2.4 to 3-scale (–1 ± 1 dB). 5. Confirm that the level difference between both channels is less than 2 dB.  Fig. 2-5-7 (a)  Fig. 2-5-7 (b)

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
15	S mode EP Frequency Responce and Balance	TP110	R101 (PRE/REC)	•S-VHS mode •EP mode •REC then PB •Multi-burst or video sweeper	1. In the same manner as above, (Sec. 2.5.14), perform adjustment for EP mode. 2. Record in the EP mode, then play back and set 100 kHz level to 3-scale on the display at CH1 waveform. 3. Adjust R101 (PRE/REC board) so that the 3.58 MHz level becomes 1.8 to 2.4-scale (–3 ± 1 dB). 4. Confirm that the level difference between both channels is less than 2 dB.
16	C NR input level	TP325	R328	•N mode •SP mode •REC then PB •Color bars •SOURCE SEL: AUX	1. Observe the TP325 waveform at V rate. 2. Adjust R328 so that the color level (A) is 0.27 ± 0.01 Vp-p.  **Fig. 2-5-8**
17	C NR NC balance	TP324	R323 T302	•N mode •SP mode •PB •MH-1 color bars •EDIT: OFF	1. Observe the TP324 waveform at V rate. 2. Adjust R323 and T302 to minimize the 3.58 MHz level "B", i.e., so that only the noise component is observable as shown in Fig. 2-5-9.  **Fig. 2-5-9**
18	C NR FB  	TP324	R321	•SP mode •PB •MH-1 color bars •EDIT: OFF	1. Short TP21 to TP GND2. Use the controls of the oscilloscope to expand portion C of the TP324 waveform as shown in Fig. 25-10. 2. Adjust R321 so that the maximum 3.58 MHz amplitude D and waveform segment E are related as follows D : E = 2 : 1 ± 0.1 **Note:** Read p-p value of D and noise center of E.  TP325 TP324 C Magnified D E 1H 2H 3H 4H **Fig. 2-5-10**

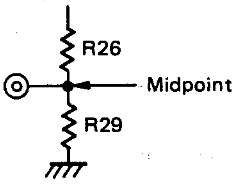
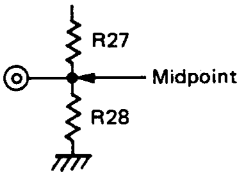
2.6 AUDIO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the AUDIO board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31, TP32 (GND)	R9	• N mode • SOURCE Select: AUX • SP mode	1. Connect a millivoltmeter between TP31 and TP32. 2. Set for REC mode without signal. 3. Adjust R9 for 4.0 mVrms.
2	Audio PB Level	AUDIO OUT	R28	• N mode • SOURCE Select: AUX • REC then PB • SP and EP mode	1. Connect an oscilloscope to AUDIO OUT. 2. Supply an audio signal (–8 dBs/1 kHz) to AUDIO IN and record together with a video signal, then play back. 3. Adjust R28 so that the audio output level during playback becomes –6 ± 1 dBs at SP mode (–6 ± 2 dBs at EP mode).
3	REC FM Level	TP53	R69	• S-VHS mode • SP mode • SOURCE Select: AUX • REC then PB • No signal	1. Set the SOURCE SELECT switch to AUX position and record in the SP mode, without an audio signal, than play back. 2. Adjust R69 for 80 mVp-p FM sudio play back voltage.
4	E-E Level	AUDIO OUT	R40 (CH1/L)	• N mode • SOURCE Select: AUX • ALC: OFF • E-E (Stop) mode • AUDIO OUT to Hi-Fi	1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, –8 dBs audio signal to AUDIO IN and a VIDEO signal to VIDEO IN. 2. Set Hi-Fi REC level controls to detent position. In the E-E (STOP) mode, adjust R40 to obtain –6 ± 0.5 dBs at AUDIO OUT.
			R41 (CH2/R)		3. In the same manner, adjust R41 for the R (CH2) channel.
5	Level Indicator	FDP (Level Ind.)	R15 (Indicator CH1/L) (AUDIO IN/OUT board)	• N mode • AUX • AUDIO OUT to Hi-Fi • E-E (Stop) mode	**Note:** Perform the level indicator adjustment after completing the E-E level adjustment (section 2.6, No. 4). 1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, –8 dBs audio signal AUDIO IN. 2. Set Hi-Fi REC level controls to detent position. In the E-E (STOP) mode, adjust R15 to the point where the FDP level indicators show 0 dB (all white LEDs light).
			R14 (Indicator CH2/R) (AUDIO IN/OUT board)		3. In the same manner, adjust R14 for the R (CH2) channel.

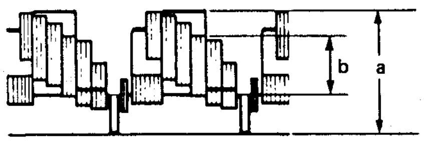
2.7 ON SCREEN CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the ON SCREEN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Character Position	TP1  	C4	• E-E	**Note:** For below adjustments use 1 : 1 probe with input capacitance less than 100 pF. 1. Connect a frequency counter to TP1 (midpoint of R26 and R29) and GND. Short base of Q2 to ground (emitter) and short the leads of R25. 2. Adjust C4 for 8.7 ± 0.05 MHz without video signal.
2	Back ground Color	TP2  	C14	• E-E	1. Connect a frequency counter to TP2 (midpoint of R27 and R28) and GND. Adjust C14 for 7.15909 ± 0.0001 MHz.

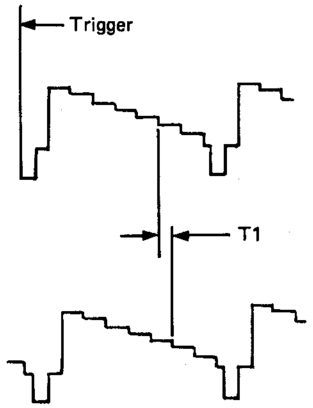
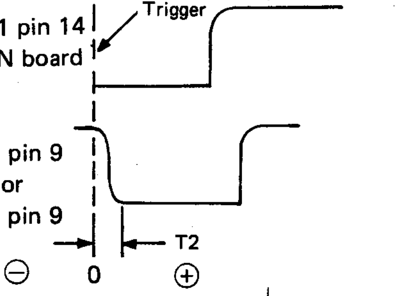
2.8 IF CIRCUIT

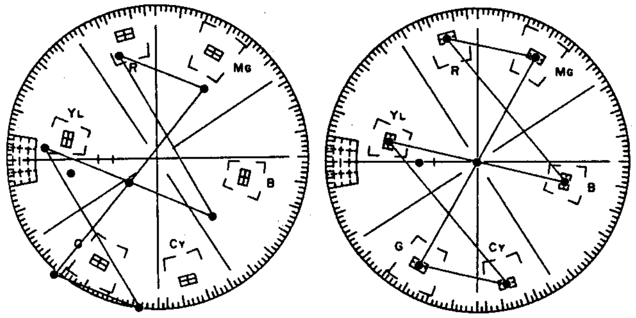
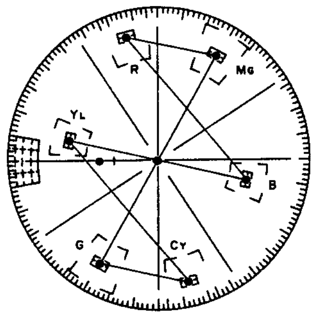
Note: Unless otherwise specified, all test points and adjustments are located on the IF board.

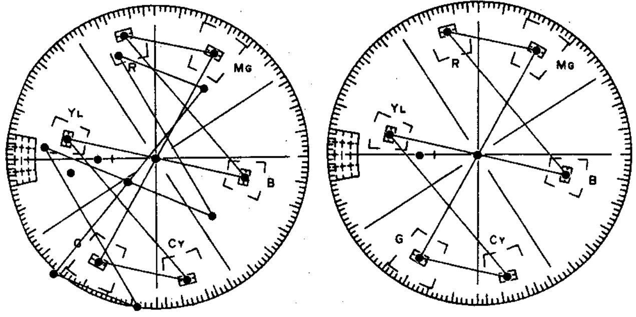
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	VCO	MONITOR	T2	• TV broadcast • Tuner mode	1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. Adjust T2 to obtain a fine picture on the monitor.
2	AFC	JP1-5	T3	• TV broadcast • Tuner mode • AFC SW: NORM	1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. With AFC SW to NORM, connect oscilloscope to pin 5 of JP1. 3. Set the oscilloscope to DC mode and adjust T3 to set the lower edge of the ripple waveform to 4.0 V.
3	Color Level  Y level = 1 Magenta level = 0.45 a : b = 1 : 0.45 Fig. 2-8-1	JP1–12	R40	• TV broadcast • Tuner mode	1. Supply a color bar signal on a VHF-HI channel (7 to 10) from a TV channel signal generator and select the channel corresponding to the generator. 2. With AFC SW OFF, adjust R40 to produce signal waveform as shown in Fig. 2-8-1. **Alternate method:** 1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. With AFC SW OFF, adjust R40 so that the magenta level becomes 2/3% of the sync. level.
4	RF AGC	MONITOR	R21	• TV broadcast • Tuner mode	**Note:** Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields. 1. Adjust R21 to minimize noise or streaks on the TV screen. 2. Check for absence of abnormality on all channels.

2.9 DIGITAL CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the DIGITAL board.

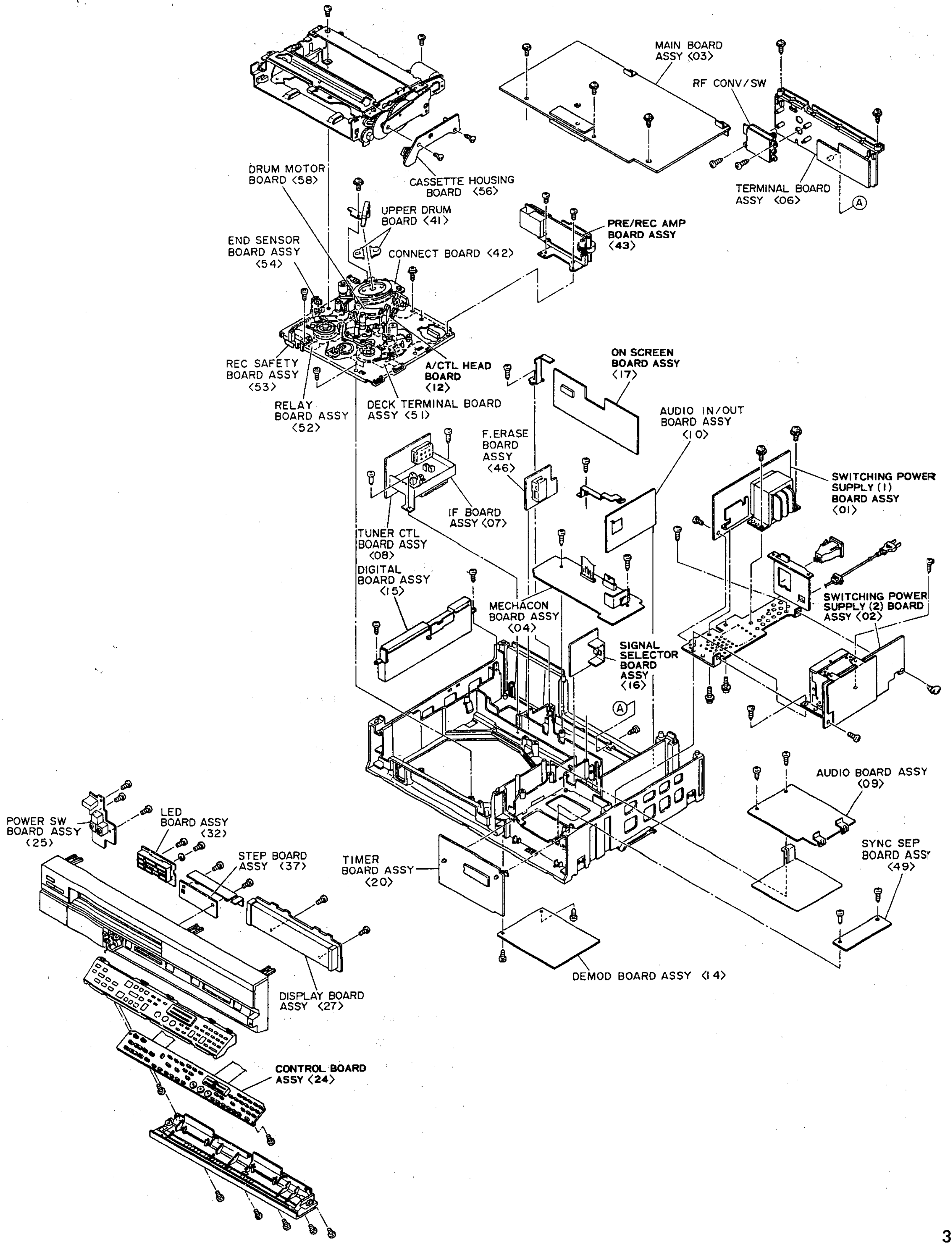
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Clock	CN1 pin 14 (Y IN) CN1 pin 10 (Y OUT) CNN board	R73  Fig. 2-9-1	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN1 pin 14 of the CNN board and the other channel to CN1 pin 10 of the CNN board and observe the waveforms. Set the mode and time base of the oscilloscope to ALT mode and 10 μs/div. Trigger the oscilloscope internally (– slope). 2. Align the two waveforms as shown in Fig. 2-9-1 and adjust R73 to set T1 to less than 1 μsec.
2	AFC	CN1 pin 14 CNN board IC2 pin 9 or IC5 pin 9	R30  Fig. 2-9-2	• E-E • Color bar	1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN1 pin 14 of the CNN board and the other channel to IC2 pin 9 and observe the waveforms. Set the mode and time base of the oscilloscope to ALT mode and 1 μsec/div. Trigger the oscilloscope internally (– slope). 2. Short IC2 pin 8 to IC2 pin 7 (SWD 5 V). Align the two waveforms (H. SYNC) as shown in Fig. 2-9-2 and adjust R30 to set T2 to less than $0^{-0}_{+0.25}$ μsec.
			R66	• E-E • Color bar	3. In the same manner, connect the other channel of a dual trace oscilloscope to IC5 pin 9, and disconnect IC2 pin 8 to IC2 pin 7 (SWD 5 V). Align the two waveforms (H. SYNC) as shown in Fig. 2-9-2 and adjust R66 to set T2 to less than $0^{-0}_{+0.25}$ μsec.
3	VCXO	IC4 pin 21	C69 (VCXO)	• E-E • No signal	1. Connect a frequency counter to IC4 pin 21, set for the E-E mode without incoming signal, and short IC4 pin 2 to IC4 pin 18 (SWD 5 V). Adjust C69 for 3.579545 MHz ± 50 Hz.
		IC1 pin 18	C19 (VCXO)		2. Connect the frequency counter to IC1 pin 18, set for the E-E mode without incoming signal, and short IC1 pin 2 to IC1 pin 15 (SWD 5 V). Adjust C19 for 3.579550 MHz ± 50 Hz.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	Carrier Balance	VIDEO OUT	R37 (CARR. BAL.) R49 (CARR. BAL.)  Incorrect Correct **Fig. 2-9-3**	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and observe the pairs of color dots on the vectorscope. 2. Set for the STROBE 3 mode, adjust R37 and R49 to observe the center of dot at the center of the display as shown in Fig. 2-9-3.
			R37 (CARR. BAL.) R49 (CARR. BAL.)	• STROBE 3 mode • Color bar	• **Alternate method** 1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trase oscilloscope to Q3 (base) and the other channel to Q4 (base). Set the mode of the oscilloscope to X-Y mode. 2. In the E-E mode, observe the pairs of color dots on the oscilloscope and TV-monitor color bar. 3. Set for the STROBE 3 mode, alternately adjust R37 and R49 to align the pairs of color dots on the oscilloscope and TV-monitor color bar with that obtained in E-E mode. **Note:** Repeat the above steps (2 and 3) several times.
5	Burst Level	VIDEO OUT	R48 (BURST LEVEL)	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect an oscilloscope to VIDEO OUT and observe the waveform on the oscilloscope. 2. Set for the STROBE 3 mode, adjust R48 so that the burst level becomes 0.24 Vp-p.
6	Color Difference Balance, Color Level and Phase	VIDEO OUT	R20 (LEVEL) R23 (PHASE) R36 (COLOR DIF.)  **Fig. 2-9-4**	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and observe the waveform on the vectorscope. 2. In the E-E mode, set the vectorscope for 75% color bar saturation as shown in Fig. 2-9-4. Set for the STROBE 3 mode and adjust R20, R23 and R36 to align the vectorscope waveform (Phase, Level to less than ±10%, 20%) with that obtained in the E-E mode.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
			R20 (LEVEL) R23 (PHASE) R36 (COLOR DIF.)		● **Alternate method** 1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to LPF1 pin 3 and the other channel to LPF2 pin 3. Set the mode of the oscilloscope to X-Y mode. 2. In the E-E mode, observe the pairs of color dots on the oscilloscope and TV-monitor color bar. 3. Set for the STROBE 3 mode, alternately adjust R20, R23 and R36 to align the pairs of color dots on the oscilloscope and TV-monitor color bar with that obtained in the E-E mode. **Note:** Repeat the above steps (2 and 3) several times.
7	Picture In Picture Phase (PIP)	VIDEO OUT	R59	• P IN P mode • Color bar • PB • MY-1 color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and set the vectorscope for 75% color bar saturation as shown in Fig. 2-9-4. Play back the color bar segment of MH-1 alignment tape. 2. Set for the picture in picture mode, adjust R59 to align picture in picture phase as shown in Fig. 2-9-5.
	 Incorrect Correct Fig. 2-9-5				● **Alternate method** 1. Supply a color bar signal to VIDEO IN, observe the TV-monitor. 2. Play back the color bar segment of MH-1 alignment tape. Set for the picture in picture (PIP) mode, adjust R59 to align phase of inserted picture with main picture.

SECTION 3
CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD LOCATIONS


MAIN BOARD ASSY ⟨03⟩
RF CONV/SW
TERMINAL BOARD ASSY ⟨06⟩
Ⓐ
DRUM MOTOR BOARD ⟨58⟩
CASSETTE HOUSING BOARD ⟨56⟩
UPPER DRUM BOARD ⟨41⟩
CONNECT BOARD ⟨42⟩
END SENSOR BOARD ASSY ⟨54⟩
PRE/REC AMP BOARD ASSY ⟨43⟩
REC SAFETY BOARD ASSY ⟨53⟩
A/CTL HEAD BOARD ⟨12⟩
RELAY BOARD ASSY ⟨52⟩
DECK TERMINAL BOARD ASSY ⟨51⟩
ON SCREEN BOARD ASSY ⟨17⟩
AUDIO IN/OUT BOARD ASSY ⟨10⟩
F.ERASE BOARD ASSY ⟨46⟩
IF BOARD ASSY ⟨07⟩
SWITCHING POWER SUPPLY (1) BOARD ASSY ⟨01⟩
TUNER CTL BOARD ASSY ⟨08⟩
DIGITAL BOARD ASSY ⟨15⟩
MECHACON BOARD ASSY ⟨04⟩
SWITCHING POWER SUPPLY (2) BOARD ASSY ⟨02⟩
SIGNAL SELECTOR BOARD ASSY ⟨16⟩
Ⓐ
AUDIO BOARD ASSY ⟨09⟩
POWER SW BOARD ASSY ⟨25⟩
LED BOARD ASSY ⟨32⟩
STEP BOARD ASSY ⟨37⟩
TIMER BOARD ASSY ⟨20⟩
SYNC SEP BOARD ASSY ⟨49⟩
DEMOD BOARD ASSY ⟨14⟩
DISPLAY BOARD ASSY ⟨27⟩
CONTROL BOARD ASSY ⟨24⟩

3.2 GENERAL INFORMATIONS

3.2.1 Connections

Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.

1 2 3 : Connector

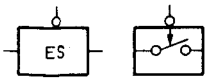
① ② ③ : Direct connection

1 2 3 : Board in connector

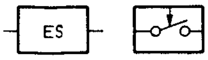
VS MS SM : Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3.2.2 Indications

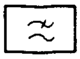
AUX : Active only at high.
$\overline{\text{AUX}}$: Active only at low.
$\overline{\text{A}}\overline{\text{U}}\overline{\text{X}}$: Active only at middle.
$\overline{\text{A}}\text{U}\overline{\text{X}}$: Active only at open.



: Active only at low for electronic switch.



: Active only at high for electronic switch.


: Low pass filter.

: High pass filter.

: Band pass filter.

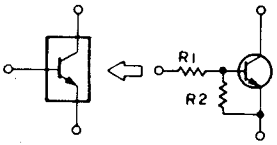
: Limiter.

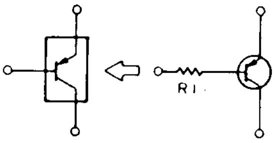
: Detector

: Amplifier.

: Mixer stage.

3.2.3 Digital transistor





DTA114T
T mark only

Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.4 Signal flow in the schematic

➡ Recording signal path
⇨ Playback signal path
➡ REC/PB signal path

3.2.5 Schematic diagram values

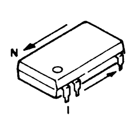
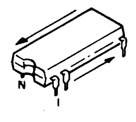
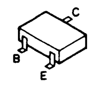
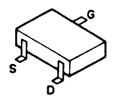
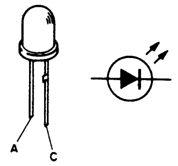
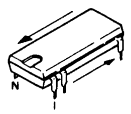
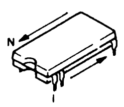
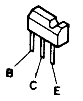
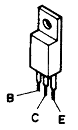
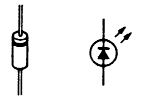
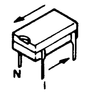
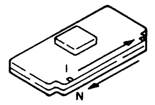
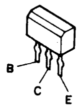
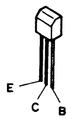
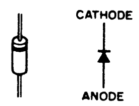
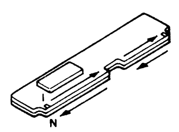
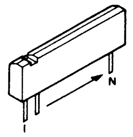
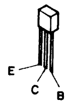
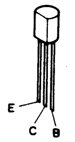
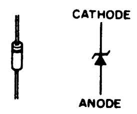
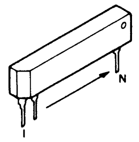
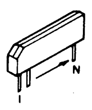
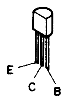
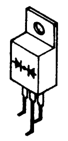
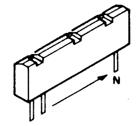
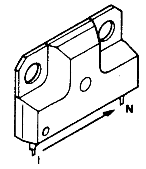
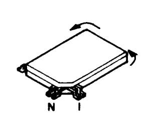
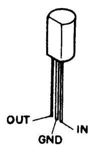
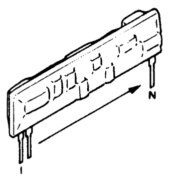
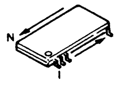
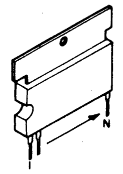
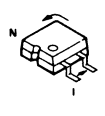
Unless otherwise specified.

1. All resistance values are in ohms, 1/6 W, 1/8 W, (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP with S-VHS mode) and playback (SP with S-VHS mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP with S-VHS mode) and playback (SP with S-VHS mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (▒) parts are critical for safety.
Replace only with specified parts numbers.

3.3 ABBREVIATIONS USED IN THE SCHEMATIC DIAGRAM

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADJ	: Adjustment
	A DUB	: Audio Dubbing
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AHD	: Audio High Density Disk
	AL	: After Loading
	ALC	: Automatic Light Compensation Automatic Level Control
	ALM	: Alarm
	ALU	: Arithmetic Logic Unit
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A/S/M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary
B	B	: Bas, Blue
	BAL	: Balance
	BATT	: Battery
	BBD	: Bucket Brigade Device
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BF	: Behind Focus
	BFP	: Burst Flag Pulse
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BNC	: Bayonet Connector
	BOT	: Beginning of Tape
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BRT	: Brightness
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White
C	C	: Capacitance, Collector, Color
	CAL	: Calibration
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CC	: Cassette Compartment
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CdS	: Cadmium Sulphide
	CD	: Count Down
	CE	: Chip Enable
	CF	: Ceramic Filter, Color Frame, Correct Focus
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CMOS	: Complementary Metal Oxide Semiconductor
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
C	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CPU	: Central Processing Unit
	CTC	: Crosstalk Cancel
	CTL	: Control
D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free Running Stop
	DG	: Differential Gain
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DP	: Differential Phase
	DPC	: Drum Phase Control
	DYAC	: Dynamic Aperture Control
E	E	: Edit, Emitter
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EOT	: End of Tape
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External
F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	: Fast Forward, Front Focus Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FMA	: FM Audio
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search
G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray
H	H	: High, Henry, Hour
	HBF	: Horizontal Burst Flag
	HD	: Horizontal Drive
	HG	: Hall Generator
	HPF	: Highpass Filter
	Hz	: Herz
I	IC	: Integrated Circuit
	ID	: Identification (Pulse)
	IF	: Intermediate Frequency
	IFR	: Infrared
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
I	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter
	I/O	: Input/Output
	IR	: Infrared
L	L	: Low, Left
	LCD	: Liquid Crystal Display
	LED	: Light Emitting Diode
	LIM	: Limiter
	LIN	: Linearity
	LLD	: Low Light Detector
	LOAD	: Loading (Cassette)
	LP	: Long Play
	LPF	: Lowpass Filter
	LSB	: Lower Sideband
M	M	: Motor, Mega
	MAX	: Maximum
	MDA	: Motor Drive Amplifier
	MECHACON	: Mechanism Control
	MIC	: Microphone
	MIN	: Minimum
	MIX	: Mixer, Mixing
	MMV	: Monostable Multivibrator
	MNOS	: Metal Nitride Oxide Semiconductor MNOS
	MOD	: Modulation, Modulator
	MODEM	: Modulator-Demodulator
	MON	: Monitor
	MOS	: Metal Oxide Semiconductor
	MPX	: Multiplexer, Multiplex
	MS	: Mode Select
	MUT	: Muting
N	NAND	: Not-And
	NC	: Not Connected, Normally Closed
	NFB	: Negative Feedback
	NLN	: Non-Linear
	NO	: Normally Open
	NOR	: Normal, Not-Or
	NR	: Noise Reduction
O	OP	: Operation
	OPAMP	: Operational Amplifier
	ORN	: Orange
	OSC	: Oscillator
P	PB	: Playback
	PC	: Photocoupler, Pulse Counter
	PCM	: Pulse Code Modulation
	PG	: Pulse Generator
	PGM	: Program
	PI	: Photo Interrupter
	PIF	: Picture Intermediate Frequency
	PLA	: Programmable Logic Array
	PLL	: Phase Locked Loop
	POS	: Position
	p-p	: Peak-to-Peak
	PR	: Pinch Roller
	PREAMP	: Preamplifier
	PRL	: Preroll
	P/S	: Pause/Still
	PSC	: Pulse Swallowing Control
	PU	: Pickup
	PUT	: Programmable Unijunction Transistor
	PWB	: Printed Wiring Board
	PWM	: Pulse Width Modulation
	PWR	: Power
R	R	: Red, Right
	RA	: Resistor Array
	RAM	: Random Access Memory
	REC	: Recording
	REF	: Reference
	REG	: Regulated, Regulator
	REM	: Remote
	REMOCON	: Remote Control (Unit)
	REV	: Reverse
	REV S	: Reverse Search
	REW	: Rewind
	RF	: Radio Frequency
	ROM	: Read Only Memory
	R/P	: Record/Playback
R	RPT	: Repeat
	RS FF	: RS Flipflop
	RST	: Reset
	RT	: Rotary Transformer
	RUN	: Running
	RY	: Relay
S	SAW	: Sawtooth, Surface Acoustic Wave
	SC	: Subcarrier, Simulcast
	SCH	: Search
	SEL	: Select, Selector
	SENS	: Sensor
	SEP	: Separator
	SF	: Source Follower
	SFF	: Short Fast Forward
	SIF	: Sound Intermediate Frequency
	SN	: Signal to Noise Ratio
	SOL	: Solenoid
	SOS	: Sound on Sound
	SP	: Standard Play
	SR	: Supply Reel
	SREW	: Short Rewind
	S/S	: Slow/Still
	SSG	: Sync Signal Generator
	SSNS	: Start Sensor
	STD	: Strobe Data, Standard
	SUP	: Supply
	SW	: Switch
	SWD	: Switched
	SYNC	: Synchronization
	SYSCON	: System Control
T	TAL	: Tally
	TBC	: Time Base Corrector
	TC	: Tension Control, Time Code
	TEN	: Tension
	TF	: Thermal Fuse
	TIM	: Timing
	TK	: Tracking
	TNR	: Tuner
	TP	: Test Point
	TPZD	: Trapezoid
	TR	: Transistor, Trimmer
	TRANS	: Transformer
	T/T	: Tuner/Timer
	TU	: Take-up
U	UL	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Vertical, Volt
	VACT	: Video Action
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	VIF	: Video Intermediate Frequency
	VLT	: Violet
	VR	: Variable Resistor
	VS	: Video and Sync
	VSCH	: Variable Search
	V/T	: Video/Television
	V/U	: VHF/UHF
	VXO	: Variable Crystal Oscillator
W	W	: Watt
	WARN	: Warning
	W & D	: White and Dark
	WHT	: White
	WV	: Working Voltage
X	XTAL	: Crystal
Y	Y	: Luminance
	YEL	: Yellow

3.4 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS

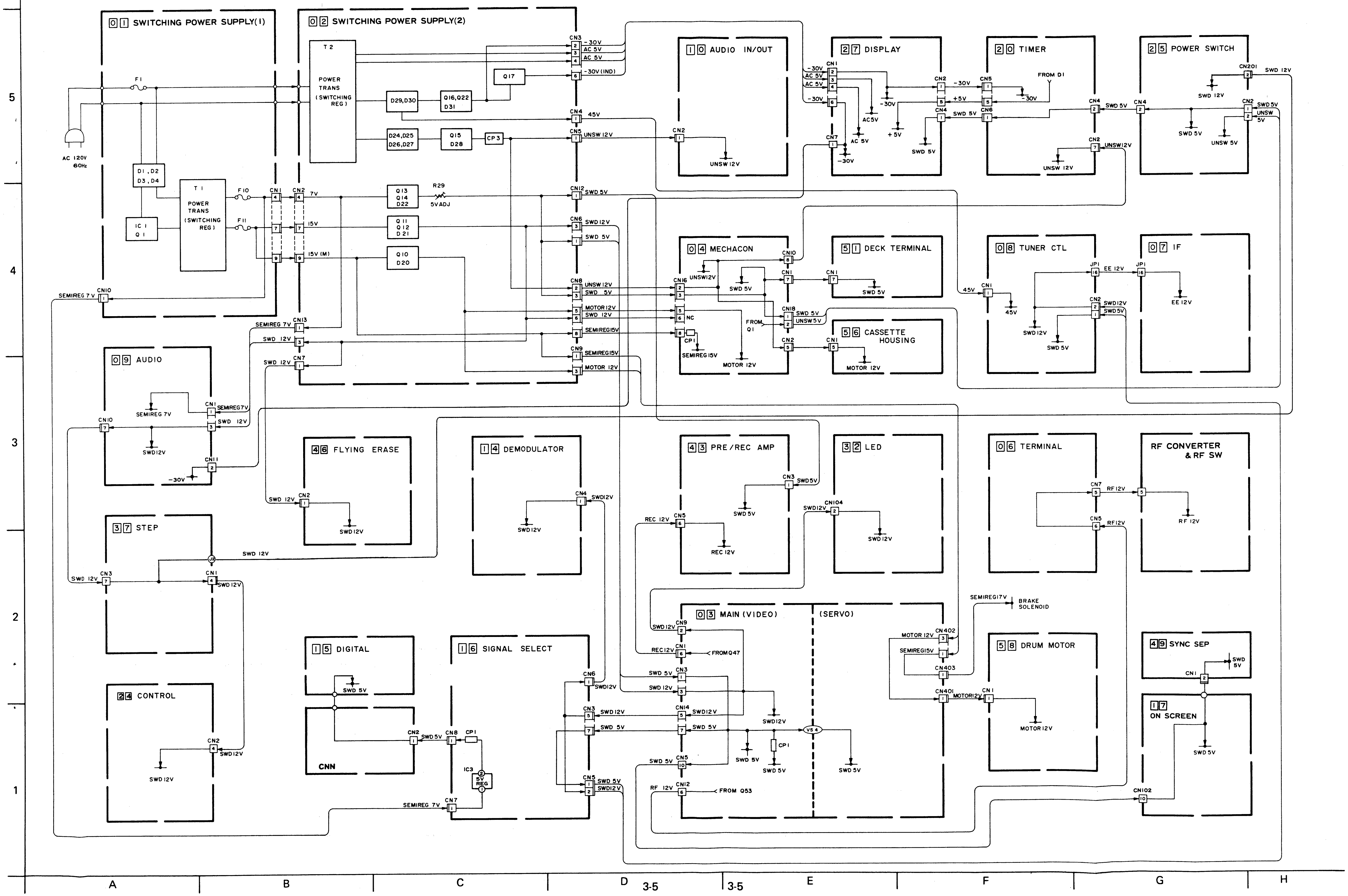
	Integrated Circuit		Transistor		Diode
	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
					

	NAME	L
	IC	
A	AN3211NK AN3380NK AN3926K AN6392	1B 1B 1B 5A
B	BA6222 BA6259N BA7001 BA7021 BA7057 BA7233 BU2767S BU2768N BU4013B BU4030B BU4030BF	9A 6A 4B 4B 2A 2A 2A 6A 2A 2A 8B
C	CXA1126S	1A
H	HA118019NT HD49712ANT	2B 1A
I	IC-PST523H-2	7B
L	LA7220	1B
M	M5M4C500L M5218P M5278L56 M50255P M50601P M50747E-897FP M50938-600 M51271FP M51272FP M51279FP M51365SP M51647SP M52678FP M52679FP M54647L M65011FP MB89010A-108 MN1220 MN3106 MN3801 MSC1146RS MSC7112-01SS	5B 3A 7B 2A 2A 7A 2B 8B 8B 8B 1B 1B 8B 8B 6B 7A 2A 1B 3A 1B 2A 1A
N	NJM2217L NJM2220S	2A 5B
P	PB20166D PB20167B-02 PB20187A PU22517D	3B 3B 4A 3B
U	UPC78N05 UPC319C UPC393C UPC7805H UPD74HC00G UPD75P108CN-018 UPD4053BC UPD75108CW-099 UPD75216ACW-058	 1B 3A 8B 1B 1B 1B 1B

	NAME	L
T	TA7361AP TC74HC4053AF TD6358P TD62003F	5A 9B 1B 8B
V	VC2034 VC2034-2	8A 8A
	TRANSISTOR	
DTA	DTA114ES DTA114TS DTA124EK DTA124ES DTA144EF DTA144ES	4C 3D 1C 4C 2C 4C
DTB	DTB114ES	4D
DTC	DTC114ES DTC124ES DTC143ES DTC143TS DTC144EF DTC144EK DTC144ES DTC144WS	4C 4C 4C 3D 2C 1C 4C 4C
DTD	DTD114ES	3D
U	UN4112 UN4212	2C 4C
2SA	2SA720 2SA854S 2SA933S 2SA1037K 2SA1309 2SA1309S 2SA1346	5C 4C 4C 1C 4C 4C 4C
2SB	2SB911 2SB1068 2SB1186	3C 4D 2D
2SC	2SC536SPA 2SC1317S 2SC1740S 2SC1741S 2SC2021 2SC2412K 2SC3311 2SC3354 2SC3399 2SC3400	4C 5C 4C 4C 2C 1C 4C 2C 4C 4C
2SD	2SD636 2SD1423 2SD1450 2SD1468S 2SD1764 2SD1796	2C 4C 4C 4C 2D 2D

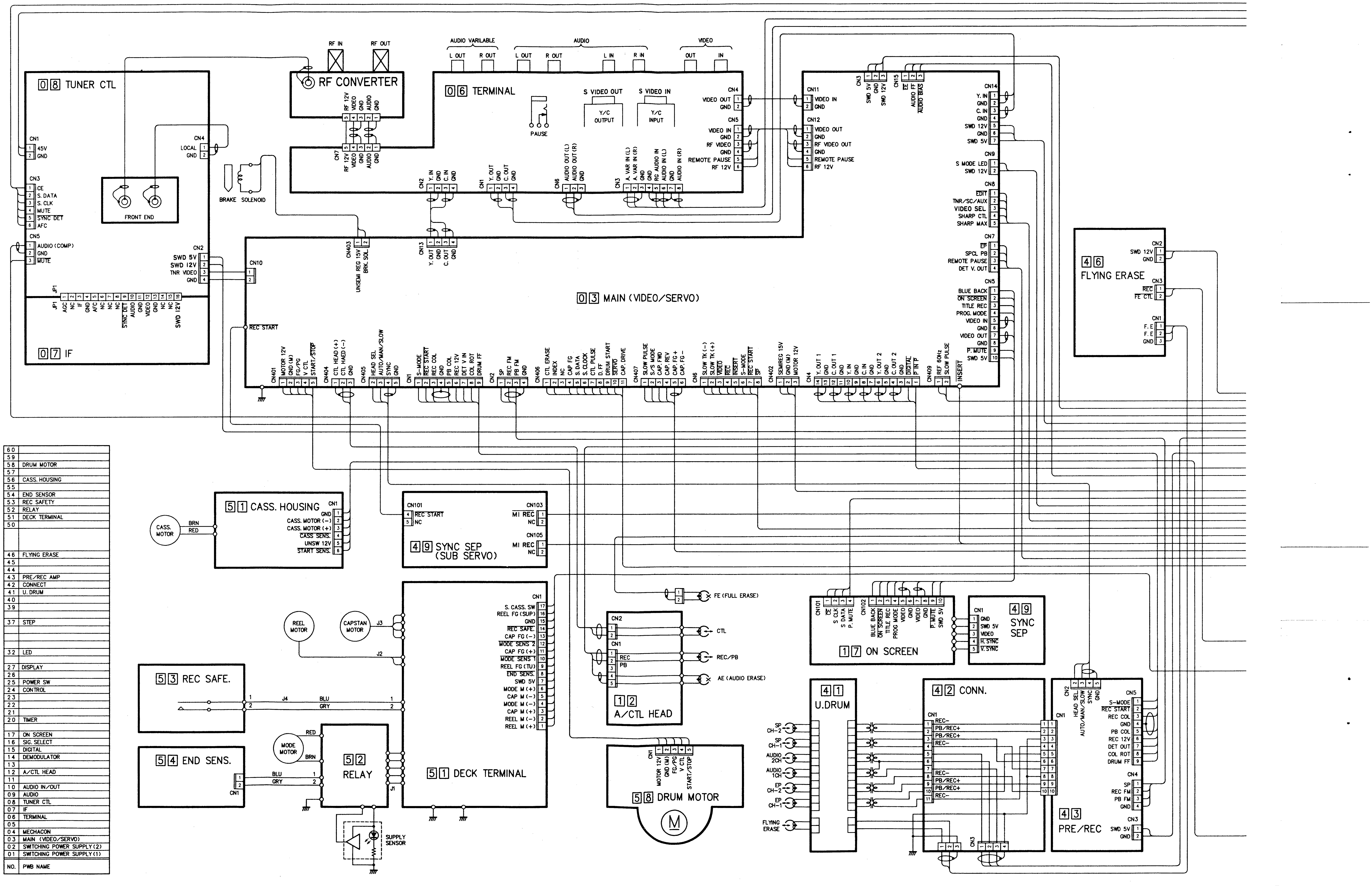
	NAME	L
	DIODE	
A	AU01Z	3E
D	DA210S DAN202K DAP209S	 3E 3E
F	F5KQ40B F6P20F FMB-24 FML-12S	5E 5E 5E 5E
G	GL-3EG43	1E
H	HZ2BLL HZ6A3 HZ30-2L HZS4.3EB2 HZS33EB1 HSS101-01	4E 4E 4E 4E 4E 3E
L	LTZ-MR15	2E
M	MA27W(B) MA165 MTZ4.3A MTZ6.8B MTZ7.5C MTZ8.2A MTZ10A MTZ10B MTZ13C MTZ20C	3E 3E 4E 4E 4E 4E 4E 4E 4E 4E
O	OA90	3E
R	RD6.2ES-T1B2 RD8.2ESB2 RD9.1ES-T1B2 RU1A	4E 4E 4E 3E
S	SLH-34VC3F SLR-34MC3F SLR-34VC3F SLV-31MC3F	1E 1E 1E 1E
U	UZ8.2BSC	4E
1	10E4 11E2 1SS99 1SS101 1SS132 1SS133	3E 3E 3E 3E 3E 3E
E	E-452-2	

3.5 POWER SYSTEM BLOCK DIAGRAM



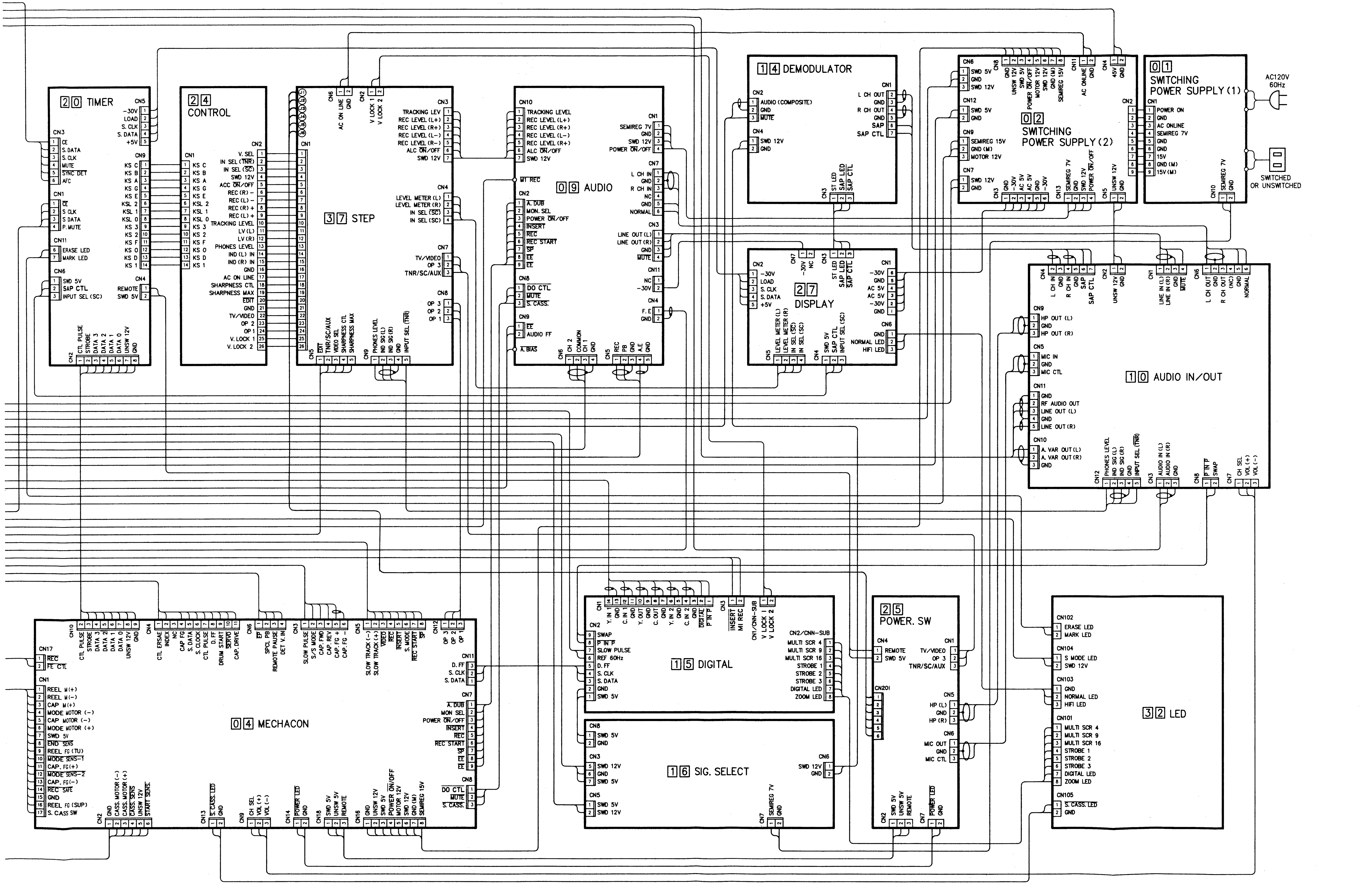
01 SWITCHING POWER SUPPLY(1)
02 SWITCHING POWER SUPPLY(2)
AC 120V 60Hz
F1
D1, D2 D3, D4
IC1 Q1
T1 POWER TRANS (SWITCHING REG)
F10
F11
T2 POWER TRANS (SWITCHING REG)
D29,D30
Q16,Q22 D31
Q17
D24,D25 D26,D27
Q15 D28
CP3
Q13 Q14 D22
R29 5V ADJ
Q11 Q12 D21
Q10 D20
7V
15V
15V (M)
CN3 -30V AC 5V AC 5V -30V (IND)
CN4 45V
CN5 UNSW 12V
CN12 SWD 5V
CN6 SWD 12V SWD 5V
CN8 UNSW 12V SWD 5V MOTOR 12V SWD 12V SEMIREG15V
CN9 SEMIREG15V MOTOR 12V
CN13 SEMIREG 7V
SWD 12V
CN7 SWD 12V
CN10 SEMIREG 7 V
10 AUDIO IN/OUT
UNSW 12V
27 DISPLAY
-30V AC 5V AC 5V -30V
AC5V AC 5V +5V -30V SWD 5V
20 TIMER
FROM D1
UNSW 12V
25 POWER SWITCH
CN201 SWD 12V
SWD 5V UNSW 5V
04 MECHACON
UNSW12V SWD 5V NC
FROM Q1
CP1 SEMIREG 15V
MOTOR 12V
51 DECK TERMINAL
SWD 5V
56 CASSETTE HOUSING
MOTOR 12V
08 TUNER CTL
45V
JP1 EE 12V
SWD12V SWD5V
07 IF
EE 12V
09 AUDIO
SEMIREG 7V
SEMIREG7V
SWD 12V
SWD12V
-30V
46 FLYING ERASE
SWD12V
14 DEMODULATOR
SWD12V
43 PRE/REC AMP
SWD5V
REC 12V
32 LED
SWD12V
06 TERMINAL
RF 12V
RF CONVERTER & RF SW
RF 12V
37 STEP
J2
SWD 12V
03 MAIN (VIDEO)
(SERVO)
FROM Q47
FROM Q53
VS4
CP1
SWD 5V
SWD12V
RF 12V
MOTOR 12V
SEMIREG15V
SEMIREG17V BRAKE SOLENOID
MOTOR12V
58 DRUM MOTOR
MOTOR12V
49 SYNC SEP
SWD 5V
17 ON SCREEN
CN102
15 DIGITAL
SWD 5V
CNN
16 SIGNAL SELECT
CP1
IC3 5V REG
SEMIREG 7V
24 CONTROL
SWD 12V
1
2
3
4
5
6
A
B
C
D
E
F
G
H

3.6 BOARD INTERCONNECTION DIAGRAM



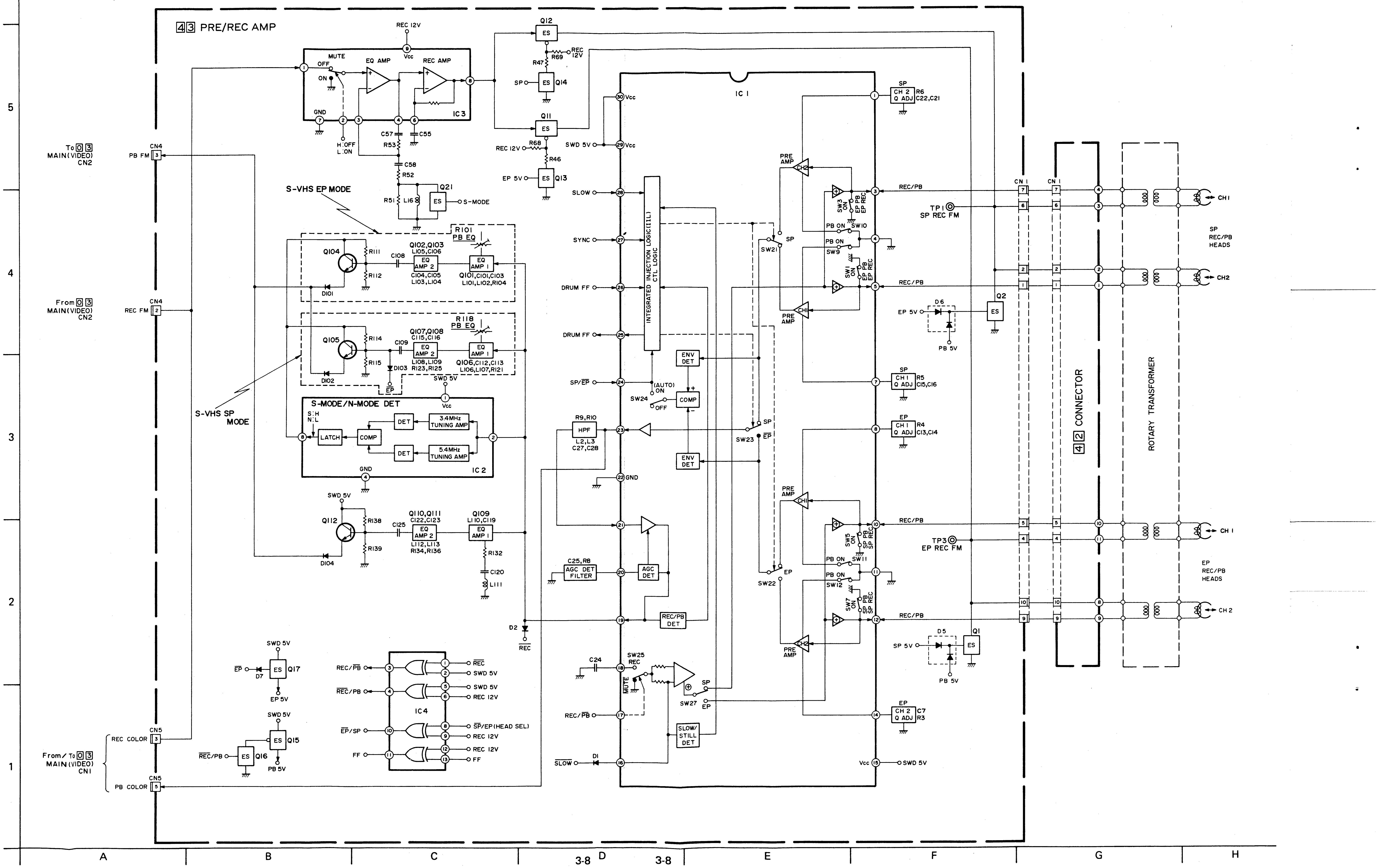
08 TUNER CTL
07 IF
FRONT END
RF IN
RF OUT
RF CONVERTER
AUDIO VARILABLE
AUDIO
VIDEO
L OUT
R OUT
L IN
R IN
OUT
IN
06 TERMINAL
S VIDEO OUT
S VIDEO IN
Y/C OUTPUT
Y/C INPUT
PAUSE
BRAKE SOLENOID
03 MAIN (VIDEO/SERVO)
REC START
46 FLYING ERASE
51 CASS. HOUSING
CASS. MOTOR
BRN
RED
49 SYNC SEP (SUB SERVO)
REEL MOTOR
CAPSTAN MOTOR
51 DECK TERMINAL
53 REC SAFE.
54 END SENS.
MODE MOTOR
52 RELAY
SUPPLY SENSOR
BLU
GRY
FE (FULL ERASE)
CTL
REC/PB
AE (AUDIO ERASE)
12 A/CTL HEAD
58 DRUM MOTOR
17 ON SCREEN
49 SYNC SEP
41 U.DRUM
42 CONN.
43 PRE/REC
FLYING ERASE
A
B
C
D
E
F
G
H
1
2
3
4
5
6

NO.	PWB NAME
60	
59	
58	DRUM MOTOR
57	
56	CASS. HOUSING
55	
54	END SENSOR
53	REC SAFETY
52	RELAY
51	DECK TERMINAL
50	
46	FLYING ERASE
45	
44	
43	PRE/REC AMP
42	CONNECT
41	U. DRUM
40	
39	
37	STEP
32	LED
27	DISPLAY
26	
25	POWER SW
24	CONTROL
23	
22	
21	
20	TIMER
17	ON SCREEN
16	SIG. SELECT
15	DIGITAL
14	DEMODULATOR
13	
12	A/CTL HEAD
11	
10	AUDIO IN/OUT
09	AUDIO
08	TUNER CTL
07	IF
06	TERMINAL
05	
04	MECHACON
03	MAIN (VIDEO/SERVO)
02	SWITCHING POWER SUPPLY(2)
01	SWITCHING POWER SUPPLY(1)



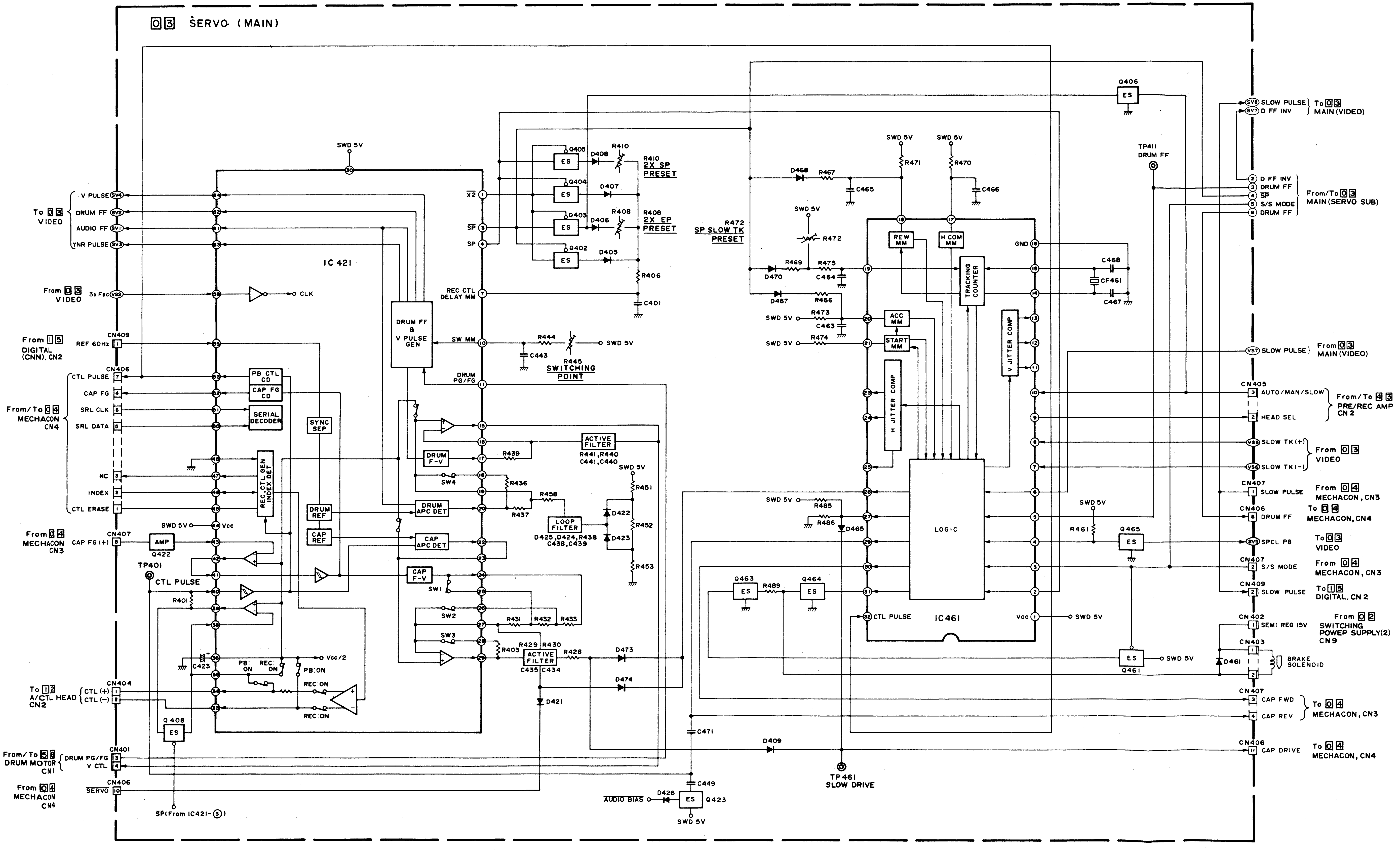
20 TIMER
CN5 -30V LOAD S. CLK S. DATA +5V
CN3 CE S. DATA S. CLK MUTE SYNC DET AFC
CN1 CE S. CLK S. DATA P. MUTE
CN11 ERASE LED MARK LED
CN6 SWD 5V SAP CTL INPUT SEL (SC)
CN9 KS C KS B KS A KS G KS E KSL 2 KSL 1 KSL 0 KS 3 KS 2 KS F KS 0 KS D KS 1
CN4 REMOTE SWD 5V
CN2 CTL PULSE STROBE DATA 3 DATA 2 DATA 1 DATA 0 UNSW 12V GND
24 CONTROL
CN1 KS C KS B KS A KS G KS E KSL 2 KSL 1 KSL 0 KS 3 KS 2 KS F KS 0 KS D KS 1
CN2 V. SEL IN SEL (TNR) IN SEL (SC) SWD 12V ACC ON/OFF REC (R) - REC (L) - REC (R) + REC (L) + TRACKING LEVEL LV (L) LV (R) PHONES LEVEL IND (L) IN IND (R) IN GND AC ON LINE SHARPNESS CTL SHARPNESS MAX EDIT GND TV/VIDEO OP 2 OP 1 V. LOCK 1 V. LOCK 2
37 STEP
CN6 AC ON LINE GND
CN2 V LOCK 1 V LOCK 2
CN3 TRACKING LEV REC LEVEL (L+) REC LEVEL (R+) REC LEVEL (L-) REC LEVEL (R-) ALC ON/OFF SWD 12V
CN4 LEVEL METER (L) LEVEL METER (R) IN SEL (SC) IN SEL (SC)
CN7 TV/VIDEO OP 3 TNR/SC/AUX
CN8 OP 3 OP 2 OP 1
CN5 EDIT TNR/SC/AUX VIDEO SEL SHARPNESS CTL SHARPNESS MAX
CN9 PHONES LEVEL IND SIG (L) IND SIG (R) GND INPUT SEL (TNR)
09 AUDIO
CN10 TRACKING LEVEL REC LEVEL (L+) REC LEVEL (R+) REC LEVEL (L-) REC LEVEL (R+) ALC ON/OFF SWD 12V
MI REC
CN2 A. DUB MON. SEL POWER ON/OFF INSERT REC START REC SP EE EE
CN8 DO CTL MUTE S. CASS.
CN9 EE AUDIO FF
A. BIAS
CN1 SEMIREG 7V GND SWD 12V POWER ON/OFF
CN7 L CH IN GND R CH IN NC GND NORMAL
CN3 LINE OUT (L) LINE OUT (R) GND MUTE
CN11 NC -30V
CN4 F. E GND
CN6 CH 2 COMMON CH 1 GND
CN5 REC PB GND A.E GND
14 DEMODULATOR
CN2 AUDIO (COMPOSITE) GND MUTE
CN4 SWD 12V GND
CN1 L CH OUT GND R CH OUT GND SAP SAP CTL
CN3 ST LED SAP LED SAP CTL
27 DISPLAY
CN2 -30V LOAD S. CLK S. DATA +5V
CN7 -30V NC
CN3 ST LED SAP LED SAP CTL
CN1 -30V GND AC 5V AC 5V -30V GND
CN6 GND NORMAL LED HIFI LED
CN5 LEVEL METER (L) LEVEL METER (R) IN SEL (SC) IN SEL (SC)
CN4 SWD 5V SAP CTL INPUT SEL (SC)
02 SWITCHING POWER SUPPLY (2)
CN6 SWD 5V GND SWD 12V
CN12 SWD 5V GND
CN9 SEMIREG 15V GND (M) MOTOR 12V
CN7 SWD 12V GND
CN8 GND UNSW 12V SWD 5V POWER ON/OFF MOTOR 12V SWD (M) GND (M) SEMIREG 15V
CN11 AC ONLINE GND
CN4 45V GND
CN2
CN3 -30V AC 5V AC 5V GND -30V
CN13 SEMIREG 7V GND SWD 12V POWER ON/OFF
CN5 UNSW 12V GND
01 SWITCHING POWER SUPPLY (1)
CN1 POWER ON GND AC ONLINE SEMIREG 7V GND GND 15V GND (M) 15V (M)
CN10 SEMIREG 7V GND
AC120V 60Hz
SWITCHED OR UNSWITCHED
10 AUDIO IN/OUT
CN4 L CH IN GND R CH IN GND SAP SAP CTL
CN2 UNSW 12V GND
CN1 LINE IN (L) LINE IN (R) GND MUTE
CN6 L CH OUT GND R CH OUT (NC) GND NORMAL
CN9 HP OUT (L) GND HP OUT (R)
CN5 MIC IN GND MIC CTL
CN11 GND RF AUDIO OUT LINE OUT (L) GND LINE OUT (R)
CN10 A. VAR OUT (L) A. VAR OUT (R) GND
CN12 PHONES LEVEL IND SIG (L) IND SIG (R) GND INPUT SEL (TNR)
CN3 AUDIO IN (L) AUDIO IN (R) GND
CN8 P IN P SWAP
CN7 CH SEL VOL (+) VOL (-)
04 MECHACON
CN17 REC FE CTL
CN1 REEL M (+) REEL M (-) CAP M (+) MODE MOTOR (-) CAP MOTOR (-) MODE MOTOR (+) SWD 5V END SENS REEL FG (TU) MODE SENS-1 CAP. FG (+) MODE SENS-2 CAP. FG (-) REC SAFE GND REEL FG (SUP) S. CASS SW
CN10 CTL PULSE STROBE DATA 3 DATA 2 DATA 1 DATA 0 UNSW 12V GND
CN4 CTL ERASE INDEX NC CAP FG S. DATA S. CLOCK CTL PULSE D. FF DRUM START SERVO CAP. DRIVE
CN6 EP SPCL PB REMOTE PAUSE DET V. IN
CN3 SLOW PULSE S/S MODE CAP. FWD CAP. REV CAP. FG + CAP. FG -
CN5 SLOW TRACK (-) SLOW TRACK (+) VIDEO REC INSERT S. MODE REC START SP
CN12 OP 3 OP 2 OP 1
CN11 D. FF S. CLK S. DATA
CN7 A. DUB MON SEL POWER ON/OFF INSERT REC REC START SP EE EE
CN8 DO CTL MUTE S. CASS.
CN2 GND CASS. MOTOR (-) CASS. MOTOR (+) CASS SENS UNSW 12V START SENS
CN13 S. CASS. LED GND
CN9 CH SEL VOL (+) VOL (-)
CN14 POWER LED GND
CN18 SWD 5V UNSW 5V REMOTE
CN16 GND UNSW 12V SWD 5V POWER ON/OFF MOTOR 12V SWD 12V GND (M) SEMIREG 15V
15 DIGITAL
CN1 Y. IN 1 GND C. IN 1 GND Y. OUT GND C. OUT GND Y. IN 2 GND C. IN 2 GND DIGITAL P IN P
CN3 INSERT MI REC
CN1/CNN-SUB V LOCK 1 V LOCK 2
CN2 SWAP P IN P SLOW PULSE REF 60Hz D. FF S. CLK S. DATA GND SWD 5V
CN2/CNN-SUB MULTI SCR 4 MULTI SCR 9 MULTI SCR 16 STROBE 1 STROBE 2 STROBE 3 DIGITAL LED ZOOM LED
16 SIG. SELECT
CN8 SWD 5V GND
CN3 SWD 12V GND SWD 5V
CN5 SWD 5V SWD 12V
CN6 SWD 12V GND
CN7 SEMIREG 7V GND
25 POWER. SW
CN4 REMOTE SWD 5V
CN1 TV/VIDEO OP 3 TNR/SC/AUX
CN201
CN5 HP (L) GND HP (R)
CN6 MIC OUT GND MIC CTL
CN2 SWD 5V UNSW 5V REMOTE
CN7 POWER LED GND
32 LED
CN102 ERASE LED MARK LED
CN104 S MODE LED SWD 12V
CN103 GND NORMAL LED HIFI LED
CN101 MULTI SCR 4 MULTI SCR 9 MULTI SCR 16 STROBE 1 STROBE 2 STROBE 3 DIGITAL LED ZOOM LED
CN105 S. CASS. LED GND
I J K L M N O P

3.7 PRE/REC AMP BLOCK DIAGRAM

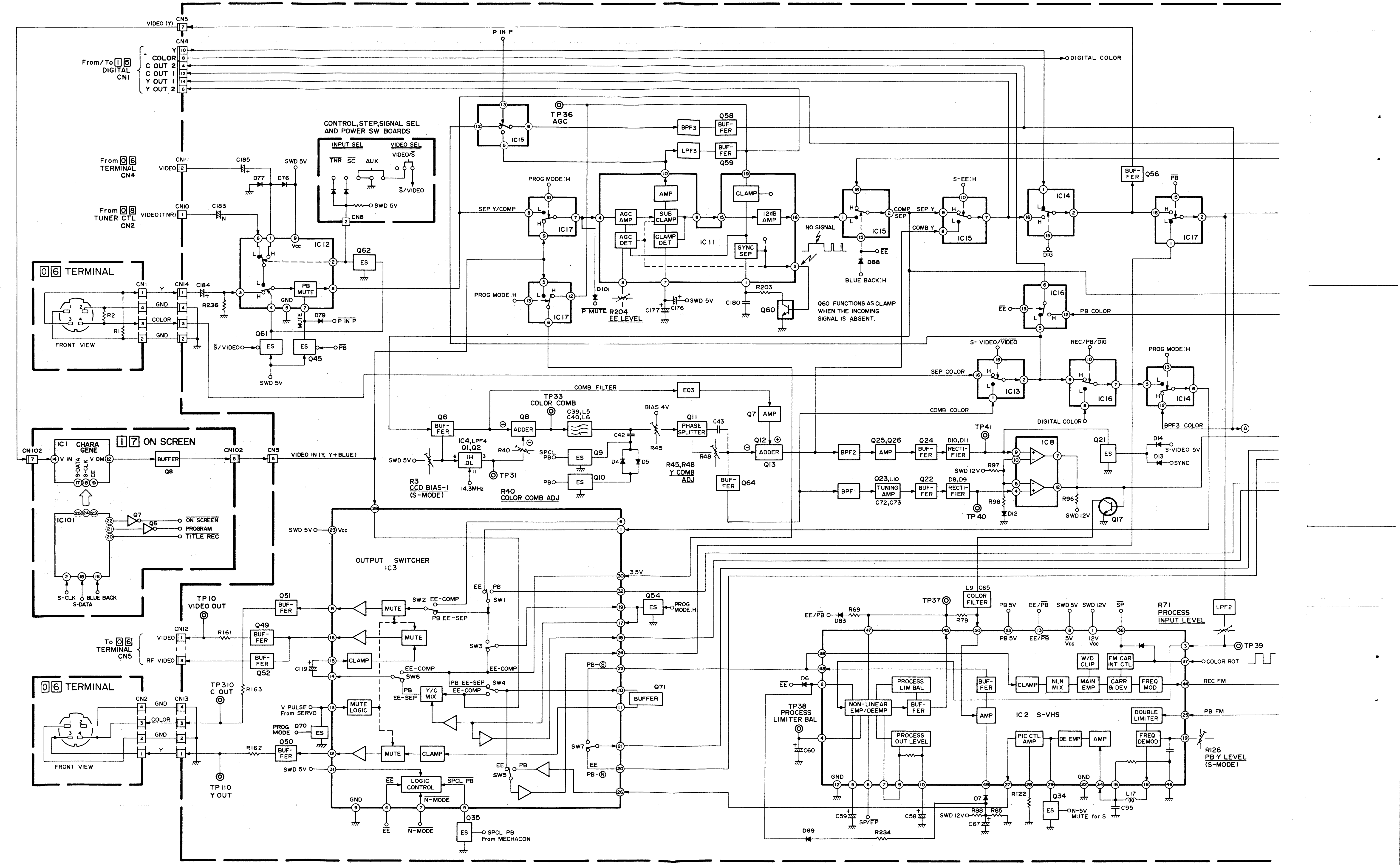


43 PRE/REC AMP
To 03 MAIN(VIDEO) CN2
CN4 PB FM 3
From 03 MAIN(VIDEO) CN2
CN4 REC FM 2
From/To 03 MAIN(VIDEO) CN1
CN5 REC COLOR 3
CN5 PB COLOR 5
REC 12V
Vcc
MUTE
OFF
ON
EQ AMP
REC AMP
GND
IC3
H:OFF
L:ON
C57
C55
R53
C58
R52
R51
L16
Q21
ES
S-MODE
S-VHS EP MODE
Q12
Q14
Q11
Q13
R69
R47
R68
R46
SP
REC 12V
EP 5V
SWD 5V
R101
PB EQ
Q104
R111
R112
D101
C108
Q102,Q103
L105,C106
EQ AMP 2
C104,C105
L103,L104
EQ AMP 1
Q101,C101,C103
L101,L102,R104
R118
PB EQ
Q105
R114
R115
D102
C109
Q107,Q108
C115,C116
L108,L109
R123,R125
D103
Q106,C112,C113
L106,L107,R121
EP
S-VHS SP MODE
S-MODE/N-MODE DET
S:H
N:L
LATCH
COMP
DET
3.4MHz TUNING AMP
5.4MHz TUNING AMP
IC2
Q112
R138
R139
D104
C125
Q110,Q111
C122,C123
L112,L113
R134,R136
Q109
L110,C119
R132
C120
L111
D2
REC
Q17
D7
EP 5V
Q15
Q16
PB 5V
IC4
REC/PB
SF/EP(HEAD SEL)
EP/SP
FF
IC1
Vcc
SLOW
SYNC
DRUM FF
SP/EP
SW24
(AUTO) ON
OFF
R9,R10
HPF
L2,L3
C27,C28
ENV DET
GND
C25,R8
AGC DET FILTER
AGC DET
REC/PB DET
C24
SW25
REC
MUTE
SW27
SLOW/STILL DET
D1
INTEGRATED INJECTION LOGIC(IIL) CTL LOGIC
SW21
SW23
SW22
PRE AMP
CH1
CH2
SW3
SW1
SW5
SW7
SW9
SW10
SW11
SW12
PB ON
CH 2 Q ADJ R6 C22,C21
CH 1 Q ADJ R5 C15,C16
CH 1 Q ADJ R4 C13,C14
CH 2 Q ADJ C7 R3
REC/PB
TP1 SP REC FM
TP3 EP REC FM
D6
D5
Q2
Q1
SP 5V
CN1
42 CONNECTOR
ROTARY TRANSFORMER
SP REC/PB HEADS
EP REC/PB HEADS
A
B
C
D
E
F
G
H
1
2
3
4
5
6

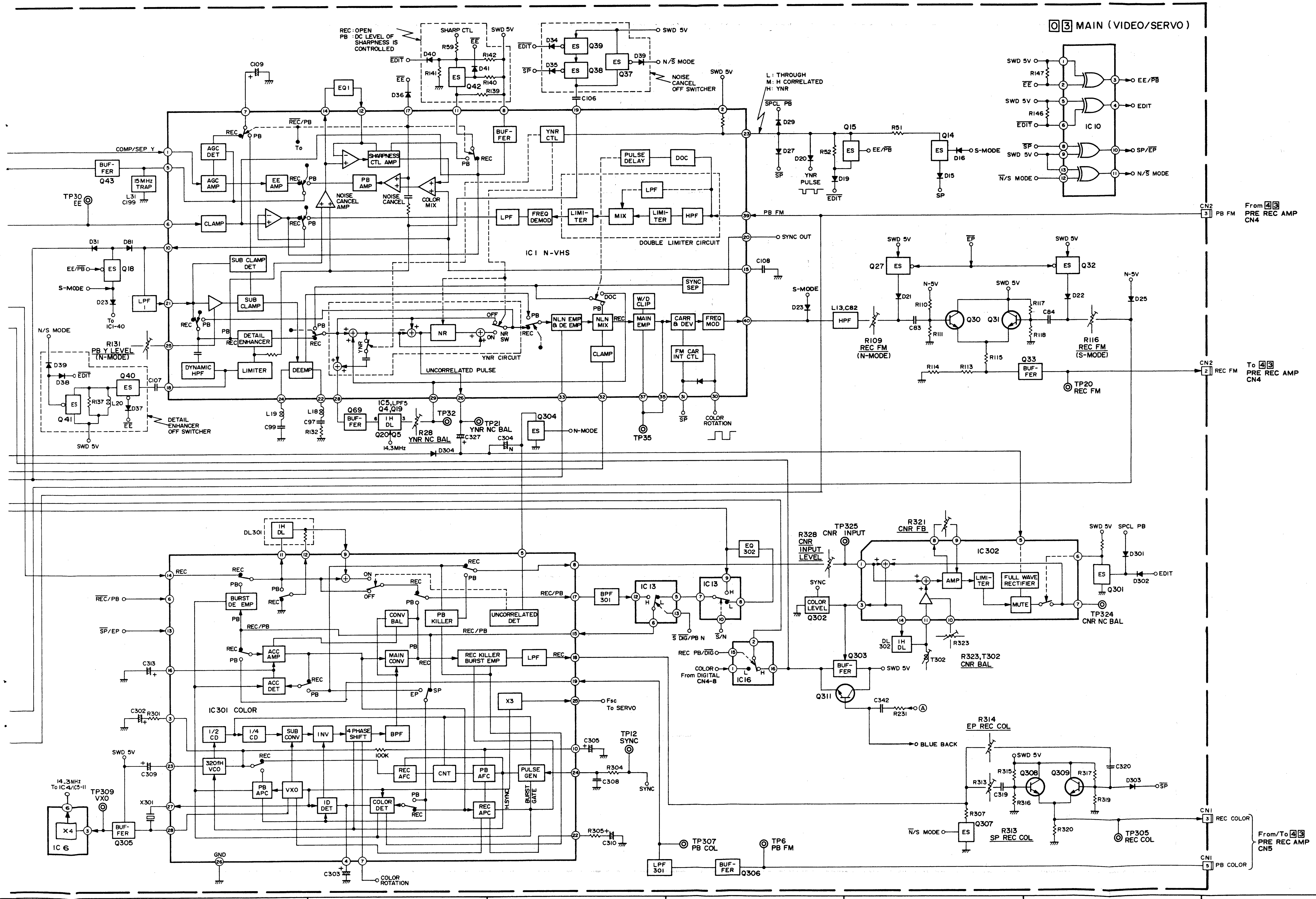
3.8 SERVO BLOCK DIAGRAM


03 SERVO (MAIN)
IC 421
IC 461
To 03 VIDEO
V PULSE SV4
DRUM FF SV2
AUDIO FF SV1
YNR PULSE SV3
From 03 VIDEO
3xFsc VS2
CLK
From 15 DIGITAL (CNN), CN2
CN409
REF 60Hz
CN406
From/To 04 MECHACON CN4
CTL PULSE
CAP FG
SRL CLK
SRL DATA
NC
INDEX
CTL ERASE
From 04 MECHACON CN3
CN407
CAP FG (+)
AMP
Q422
TP401
CTL PULSE
R401
C423
PB: ON
REC: ON
PB:ON
REC:ON
Vcc/2
To 12 A/CTL HEAD CN2
CN404
CTL (+)
CTL (−)
Q408
ES
From/To 56 DRUM MOTOR CN1
CN401
DRUM PG/FG
V CTL
From 04 MECHACON CN4
CN406
SERVO
SP (From IC421-3)
SWD 5V
Vcc
PB CTL CD
CAP FG CD
SERIAL DECODER
REC.CTL GEN INDEX DET
SYNC SEP
DRUM REF
CAP REF
DRUM FF & V PULSE GEN
DRUM F-V
DRUM APC DET
CAP APC DET
CAP F-V
SW1
SW2
SW3
SW4
X2
SP
SP
REC CTL DELAY MM
SW MM
DRUM PG/FG
Q405
Q404
Q403
Q402
D408
D407
D406
D405
R410
R408
R410 2X SP PRESET
R408 2X EP PRESET
R406
C401
R444
C443
R445 SWITCHING POINT
SWD 5V
ACTIVE FILTER
R441,R440 C441,C440
R439
R436
R437
R458
LOOP FILTER
D425,D424,R438 C438,C439
D422
D423
R451
R452
R453
R403
R431
R432
R433
R429 R430
R428
ACTIVE FILTER
C435 C434
D473
D474
D421
C471
C449
D426
AUDIO BIAS
Q423
D409
TP461 SLOW DRIVE
Q406
TP411 DRUM FF
R472 SP SLOW TK PRESET
D468
R467
C465
R471
R470
C466
R472
D470
R469
R475
C464
D467
R466
R473
C463
R474
REW MM
H COM MM
TRACKING COUNTER
ACC MM
START MM
H JITTER COMP
V JITTER COMP
GND
LOGIC
C468
CF461
C467
R485
R486
D465
Q463
R489
Q464
CTL PULSE
Vcc
R461
Q465
Q461
D461
SV8 SLOW PULSE
SV7 D FF INV
To 03 MAIN (VIDEO)
D FF INV
DRUM FF
SP
S/S MODE
DRUM FF
From/To 03 MAIN (SERVO SUB)
VS7 SLOW PULSE
From 03 MAIN (VIDEO)
CN405
AUTO/MAN/SLOW
HEAD SEL
From/To 43 PRE/REC AMP CN2
VS5 SLOW TK (+)
VS6 SLOW TK (−)
From 03 VIDEO
CN407
SLOW PULSE
From 04 MECHACON, CN3
CN406
DRUM FF
To 04 MECHACON, CN4
SV5 SPCL PB
To 03 VIDEO
CN407
S/S MODE
From 04 MECHACON, CN3
CN409
SLOW PULSE
To 15 DIGITAL, CN 2
CN402
SEMI REG 15V
From 02 SWITCHING POWEP SUPPLY(2) CN9
CN403
BRAKE SOLENOID
CN407
CAP FWD
CAP REV
To 04 MECHACON, CN3
CN406
CAP DRIVE
To 04 MECHACON, CN4

3.9 VIDEO BLOCK DIAGRAM

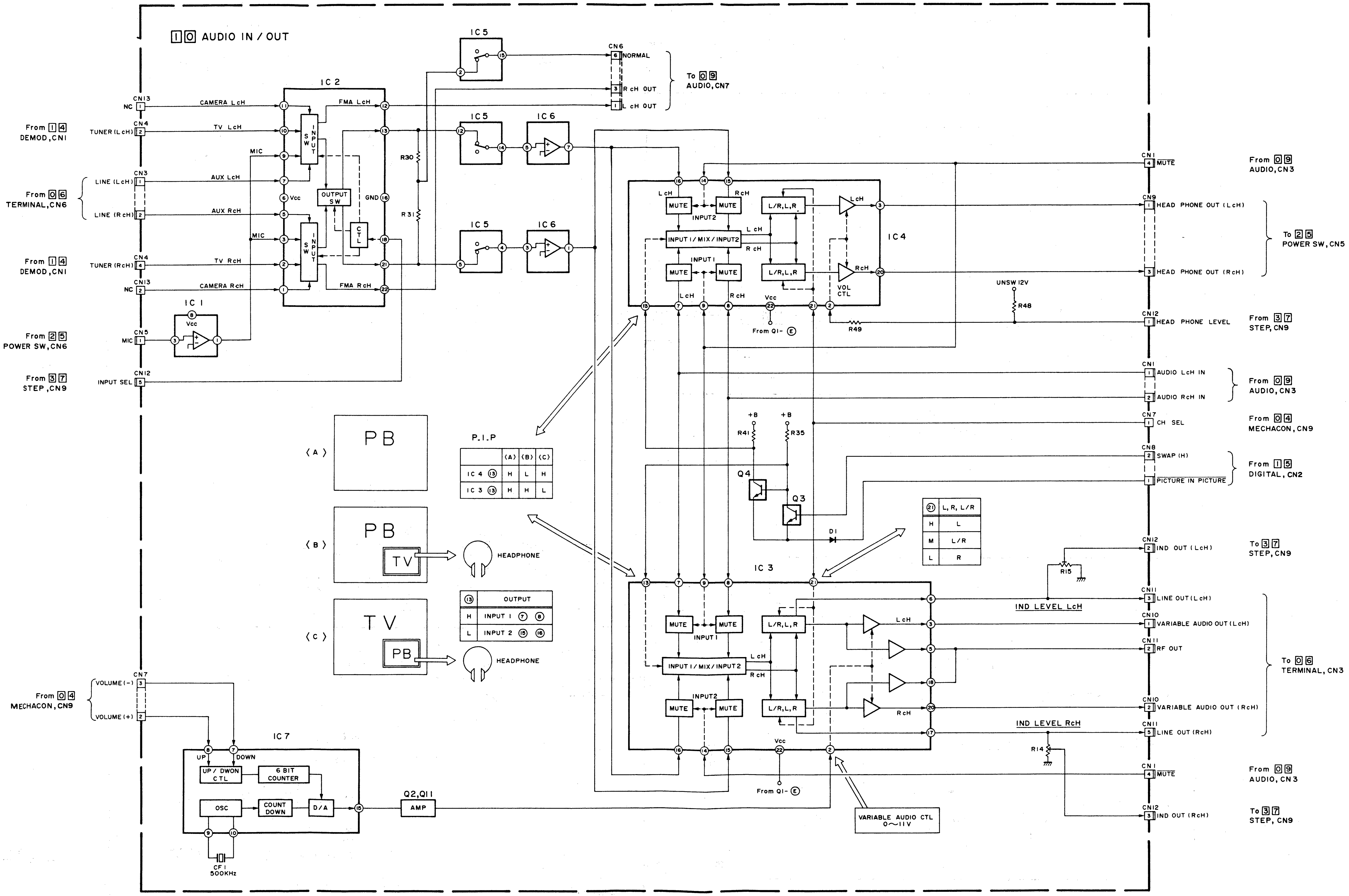

VIDEO (Y) CN5
CN4
From/To 15 DIGITAL CN1
Y
COLOR
C OUT 2
C OUT 1
Y OUT 1
Y OUT 2
DIGITAL COLOR
P IN P
TP36 AGC
IC15
BPF3
LPF3
Q58 BUFFER
Q59 BUFFER
CONTROL, STEP, SIGNAL SEL AND POWER SW BOARDS
INPUT SEL
TNR SC AUX
VIDEO SEL
VIDEO/S
S/VIDEO
SWD 5V
CN8
From 06 TERMINAL CN4
CN11 VIDEO
C185
D77 D76
From 08 TUNER CTL CN2
CN10 VIDEO(TNR)
C183
IC12
Q62 ES
PB MUTE
06 TERMINAL
FRONT VIEW
CN1 CN14
GND
COLOR
R236
C184
MUTE
D79
P IN P
Q61 ES
Q45 ES
S/VIDEO
PB
PROG MODE:H
SEP Y/COMP
IC17
AGC AMP
AGC DET
SUB CLAMP
CLAMP DET
AMP
CLAMP
12dB AMP
SYNC SEP
IC11
D101
P MUTE
R204 EE LEVEL
C177 C176
C180
R203
Q60
Q60 FUNCTIONS AS CLAMP WHEN THE INCOMING SIGNAL IS ABSENT.
NO SIGNAL
COMP SEP
SEP Y
COMB Y
EE
D88
BLUE BACK:H
S-EE:H
IC14
DIG
BUFFER Q56
IC16
PB COLOR
S-VIDEO/VIDEO
SEP COLOR
IC13
REC/PB/DIG
DIGITAL COLOR
PROG MODE:H
BPF3 COLOR
COMB COLOR
COMB FILTER
EQ3
TP33 COLOR COMB
C39, L5 C40, L6
Q6 BUFFER
Q8 ADDER
R40
IC4, LPF4 Q1, Q2
1H DL
14.3MHz
TP31
R3 CCD BIAS-1 (S-MODE)
R40 COLOR COMB ADJ
SPCL PB
Q9 ES
Q10 ES
C42
D4 D5
BIAS 4V
R45
Q11 PHASE SPLITTER
C43
R48
R45, R48 Y COMB ADJ
Q7 AMP
Q12 ADDER Q13
BUFFER Q64
BPF2
Q25, Q26 AMP
Q24 BUFFER
D10, D11 RECTIFIER
TP41
IC8
SWD 12V
R97
BPF1
Q23, L10 TUNING AMP C72, C73
Q22 BUFFER
D8, D9 RECTIFIER
R98
D12
TP40
R96
Q17
Q21 ES
D14
S-VIDEO 5V
D13
SYNC
CN102
IC1 CHARA GENE
V IN
V OM
S-DATA S-CLK CE
17 ON SCREEN
BUFFER Q8
IC101
Q7 Q5
ON SCREEN
PROGRAM
TITLE REC
S-CLK
S-DATA
BLUE BACK
VIDEO IN (Y, Y+BLUE)
OUTPUT SWITCHER IC3
SWD 5V Vcc
3.5V
Q51 BUFFER
MUTE
SW2 EE-COMP
PB EE-SEP
EE PB SW1
SW3
EE-COMP
Q54 ES
PROG MODE:H
TP10 VIDEO OUT
To 06 TERMINAL CN5
CN12
VIDEO
RF VIDEO
R161
Q49 BUFFER
Q52 BUFFER
CLAMP
C119
SW6
EE-SEP
Y/C MIX
PB EE-SEP SW4
EE-COMP
PB-S
Q71 BUFFER
TP310 C OUT
R163
V PULSE From SERVO
MUTE LOGIC
PROG MODE Q70 ES
SW7
EE
PB-N
06 TERMINAL
CN2 CN13
FRONT VIEW
R162
Q50 BUFFER
SWD 5V
TP110 Y OUT
EE PB SW5
LOGIC CONTROL
SPCL PB
N-MODE
GND
Q35 ES
SPCL PB From MECHACON
L9 C65 COLOR FILTER
TP37
EE/PB
R69
D83
R79
PB 5V
EE/PB
SWD 5V
SWD 12V
SP
5V Vcc
12V Vcc
R71 PROCESS INPUT LEVEL
LPF2
TP39
COLOR ROT
REC FM
PB FM
W/D CLIP
FM CAR INT CTL
BUFFER
CLAMP
NLN MIX
MAIN EMP
CARR & DEV
FREQ MOD
D6
PROCESS LIM BAL
NON-LINEAR EMP/DEEMP
BUFFER
PROCESS OUT LEVEL
AMP
IC2 S-VHS
DOUBLE LIMITER
FREQ DEMOD
PIC CTL AMP
DE EMP
TP38 PROCESS LIMITER BAL
C60
R126 PB Y LEVEL (S-MODE)
C59
SP/EP
C58
SWD 12V
R88 R85
C67
D7
R122
Q34 ES
N-5V MUTE for S
C95
L17
D89
R234
A B C D E F G H
1 2 3 4 5 6

03 MAIN (VIDEO/SERVO)



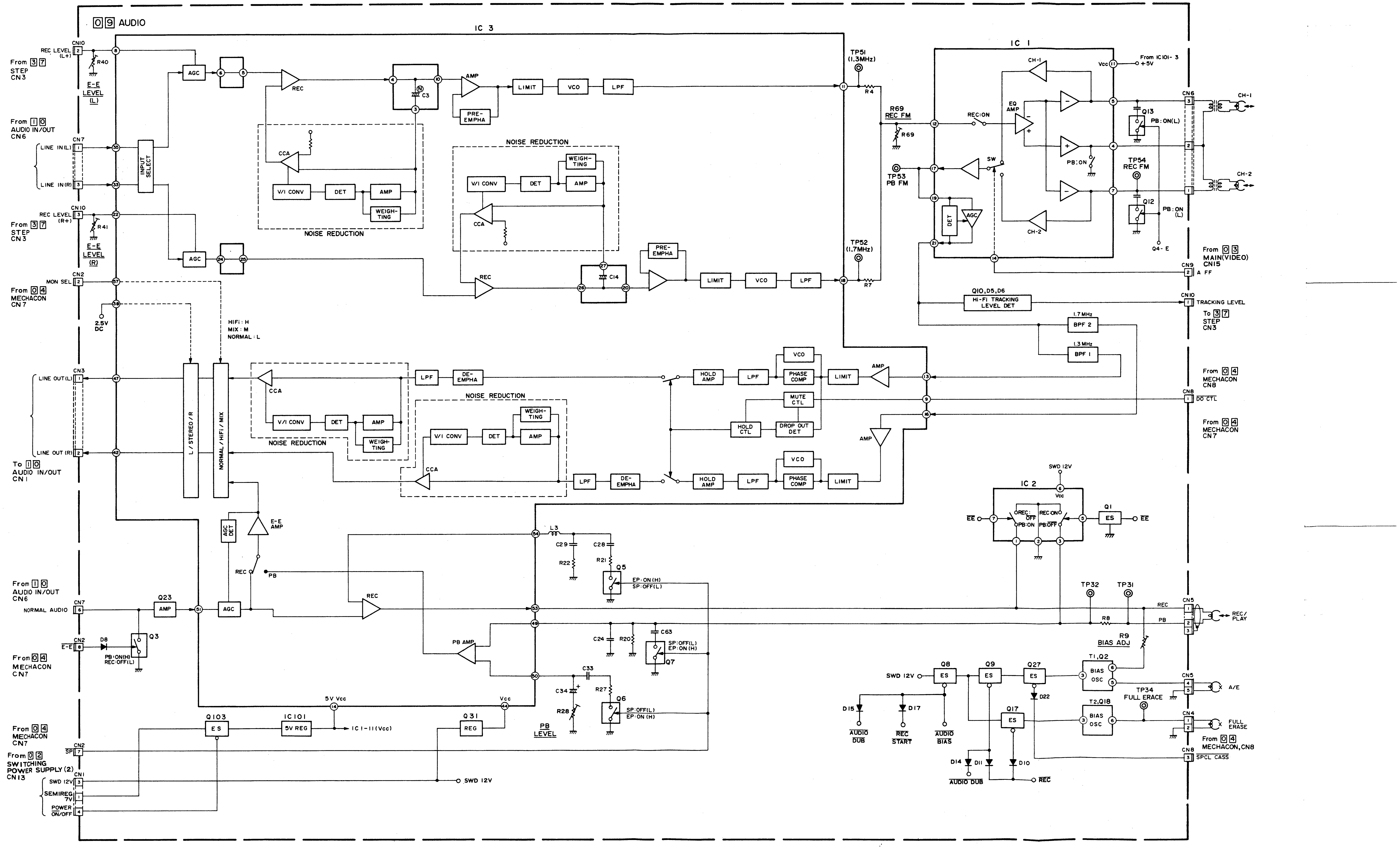
IC1 N-VHS
IC301 COLOR
IC302
IC10
IC13
IC16
IC 6
DOUBLE LIMITER CIRCUIT
SHARP CTL
REC: OPEN
PB: DC LEVEL OF SHARPNESS IS CONTROLLED
NOISE CANCEL OFF SWITCHER
DETAIL ENHANCER OFF SWITCHER
L: THROUGH
M: H CORRELATED
H: YNR
COMP/SEP Y
BUF-FER Q43
15MHz TRAP
TP30 EE
AGC DET
AGC AMP
EE AMP
PB AMP
CLAMP
SHARPNESS CTL AMP
NOISE CANCEL AMP
NOISE CANCEL
COLOR MIX
EQ1
YNR CTL
BUF-FER
PULSE DELAY
DOC
LPF
MIX
LIMI-TER
HPF
FREQ DEMOD
SUB CLAMP DET
SUB CLAMP
DETAIL ENHANCER
DYNAMIC HPF
LIMITER
DEEMP
NR
NR SW
YNR CIRCUIT
UNCORRELATED PULSE
SYNC SEP
W/D CLIP
NLN EMP & DE EMP
NLN MIX
MAIN EMP
CARR & DEV
FREQ MOD
FM CAR INT CTL
SYNC OUT
PB FM
PB Y LEVEL (N-MODE) R131
YNR NC BAL R28
TP21 YNR NC BAL
TP32
TP35
COLOR ROTATION
SWD 5V
N/S MODE
S-MODE
EE/PB
EDIT
SP/EP
N/S MODE
YNR PULSE
SPCL PB
REC FM (N-MODE) R109
REC FM (S-MODE) R116
TP20 REC FM
CN2 3 PB FM From 43 PRE REC AMP CN4
CN2 2 REC FM To 43 PRE REC AMP CN4
1H DL
DL301
BURST DE EMP
ACC AMP
ACC DET
CONV BAL
PB KILLER
MAIN CONV
REC KILLER BURST EMP
UNCORRELATED DET
BPF 301
EQ 302
X3
1/2 CD
1/4 CD
SUB CONV
INV
4 PHASE SHIFT
BPF
320fH VCO
PB APC
VXO
ID DET
COLOR DET
REC AFC
CNT
PB AFC
PULSE GEN
REC APC
H.SYNC
BURST GATE
Fsc To SERVO
TP12 SYNC
14.3MHz To IC4/IC5-11
TP309 VXO
X4
BUF-FER Q305
TP307 PB COL
TP6 PB FM
LPF 301
BUF-FER Q306
REC PB/DIG
COLOR From DIGITAL CN4-8
S DIG/PB N
S/N
R328 CNR INPUT LEVEL
TP325 CNR INPUT
R321 CNR FB
COLOR LEVEL Q302
AMP
LIMI-TER
FULL WAVE RECTIFIER
MUTE
TP324 CNR NC BAL
R323,T302 CNR BAL
BUF-FER Q303
Q311
BLUE BACK
R314 EP REC COL
R313 SP REC COL
TP305 REC COL
CN1 3 REC COLOR
CN1 5 PB COLOR
From/To 43 PRE REC AMP CN5

3.10 AUDIO IN/OUT BLOCK DIAGRAM

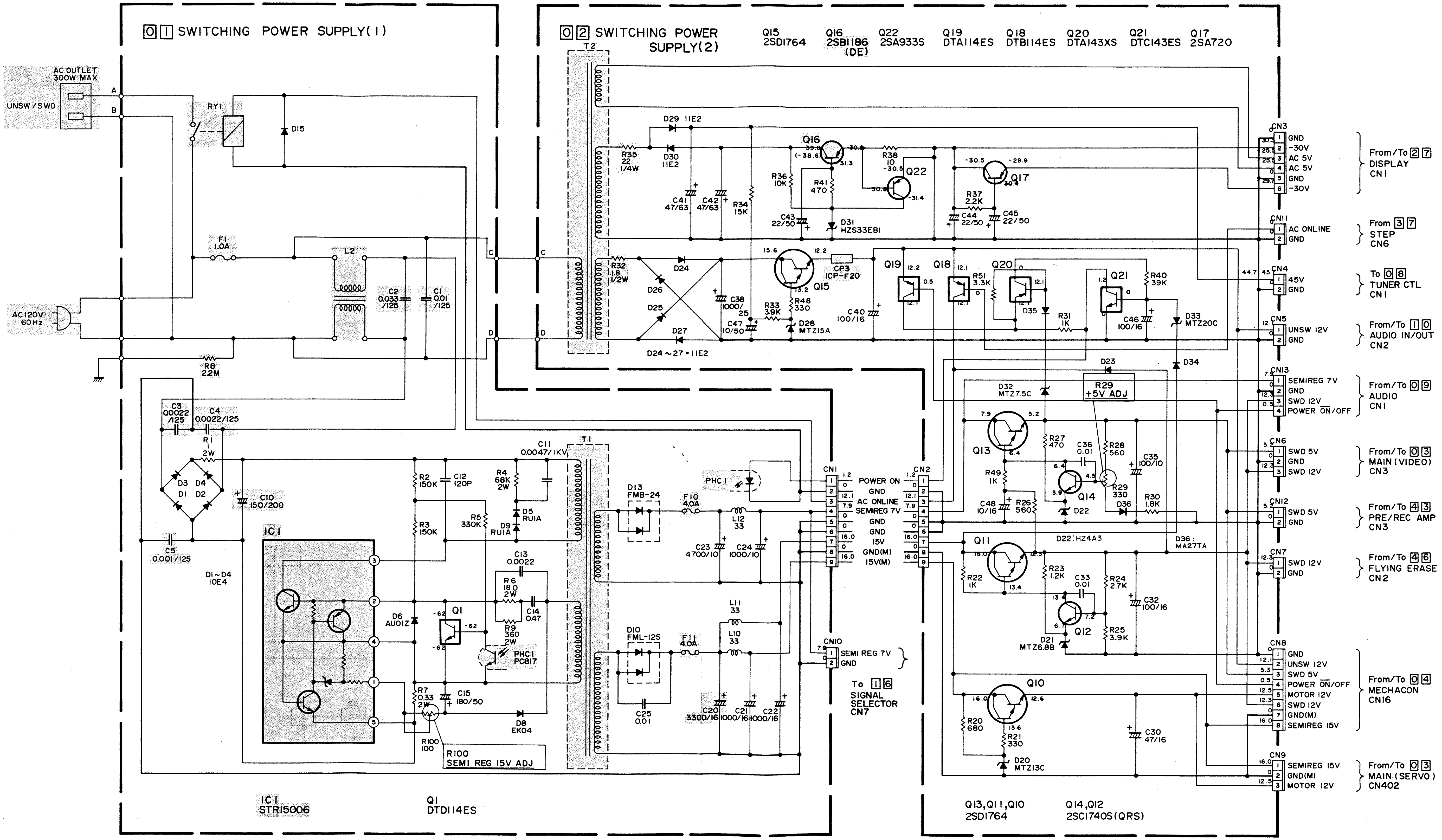


10 AUDIO IN / OUT
From 14 DEMOD,CN1
From 06 TERMINAL,CN6
From 14 DEMOD,CN1
From 25 POWER SW,CN6
From 37 STEP,CN9
From 04 MECHACON,CN9
CN13 NC 1
CN4 TUNER (LcH) 2
CN3 LINE (LcH) 1
LINE (RcH) 2
CN4 TUNER (RcH) 4
CN13 NC 2
CN5 MIC 1
CN12 INPUT SEL 5
CN7 VOLUME (−) 3
VOLUME (+) 2
CAMERA LcH
TV LcH
MIC
AUX LcH
AUX RcH
MIC
TV RcH
CAMERA RcH
IC 2
INPUT SW
OUTPUT SW
CTL
FMA LcH
FMA RcH
Vcc
GND
IC 1
Vcc
R30
R31
IC 5
IC 5
IC 6
IC 5
IC 6
CN6
NORMAL
R cH OUT
L cH OUT
To 09 AUDIO,CN7
IC 4
LcH
RcH
MUTE
INPUT2
INPUT 1/MIX/INPUT2
INPUT 1
L/R,L,R
L cH
R cH
VOL CTL
Vcc
From Q1-Ⓔ
CN1 MUTE
From 09 AUDIO,CN3
CN9 HEAD PHONE OUT (LcH)
HEAD PHONE OUT (RcH)
To 25 POWER SW,CN5
UNSW 12V
R48
R49
CN12 HEAD PHONE LEVEL
From 37 STEP,CN9
CN1 AUDIO LcH IN
AUDIO RcH IN
From 09 AUDIO,CN3
+B
+B
R41
R35
CN7 CH SEL
From 04 MECHACON,CN9
CN8 SWAP (H)
PICTURE IN PICTURE
From 15 DIGITAL,CN2
Q4
Q3
D1
(A) PB
(B) PB TV
HEADPHONE
(C) TV PB
HEADPHONE
P.I.P
	(A)	(B)	(C)
IC 4 ⑬	H	L	H
IC 3 ⑬	H	H	L
⑬	OUTPUT
H	INPUT 1 ⑦ ⑧
L	INPUT 2 ⑮ ⑯
㉑	L, R, L/R
H	L
M	L/R
L	R
IC 3
MUTE
INPUT 1
INPUT 1/MIX/INPUT2
INPUT2
L/R,L,R
L cH
R cH
LcH
RcH
Vcc
From Q1-Ⓔ
VARIABLE AUDIO CTL 0～11V
CN12 IND OUT (LcH)
To 37 STEP,CN9
R15
IND LEVEL LcH
CN11 LINE OUT (LcH)
CN10 VARIABLE AUDIO OUT (LcH)
CN11 RF OUT
To 06 TERMINAL,CN3
CN10 VARIABLE AUDIO OUT (RcH)
IND LEVEL RcH
CN11 LINE OUT (RcH)
R14
CN1 MUTE
From 09 AUDIO,CN3
CN12 IND OUT (RcH)
To 37 STEP,CN9
IC 7
UP
DOWN
UP / DWON CTL
6 BIT COUNTER
OSC
COUNT DOWN
D/A
Q2,Q11
AMP
CF1 500KHz

3.11 AUDIO BLOCK DIAGRAM

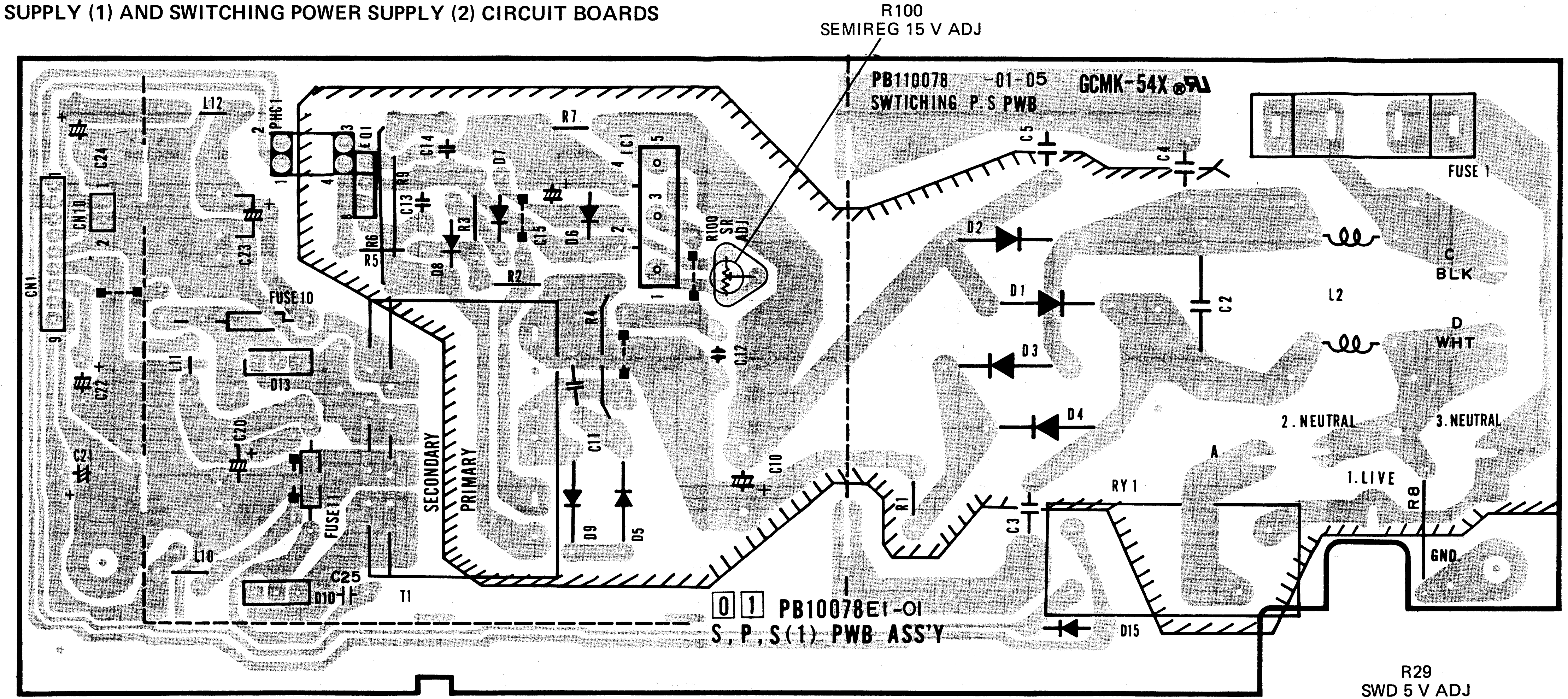

09 AUDIO
IC 3
IC 1
IC 2
From 37 STEP CN3
REC LEVEL (L+)
CN10
R40
E-E LEVEL (L)
From 10 AUDIO IN/OUT CN6
CN7
LINE IN(L)
LINE IN(R)
INPUT SELECT
REC LEVEL (R+)
R41
E-E LEVEL (R)
MON SEL
From 04 MECHACON CN7
2.5V DC
AGC
REC
AMP
C3
PRE-EMPHA
LIMIT
VCO
LPF
CCA
V/I CONV
DET
WEIGH-TING
NOISE REDUCTION
C14
TP51 (1.3MHz)
TP52 (1.7MHz)
R4
R7
R69 REC FM
TP53 PB FM
Vcc
From IC101-3 +5V
CH-1
CH-2
REC:ON
EQ AMP
SW
PB:ON
TP54 REC FM
Q13
PB:ON(L)
Q12
PB:ON (L)
Q4-E
CN6
From 03 MAIN(VIDEO) CN15
CN9
A FF
Q10,D5,D6
HI-FI TRACKING LEVEL DET
TRACKING LEVEL
To 37 STEP CN3
1.7MHz
BPF 2
1.3MHz
BPF 1
HIFI : H
MIX : M
NORMAL : L
CN3
LINE OUT(L)
LINE OUT(R)
To 10 AUDIO IN/OUT CN1
L / STEREO / R
NORMAL / HIFI / MIX
DE-EMPHA
HOLD AMP
PHASE COMP
MUTE CTL
HOLD CTL
DROP OUT DET
From 04 MECHACON CN8
CN8
DO CTL
From 04 MECHACON CN7
SWD 12V
EE
REC: OFF
PB:ON
REC:ON
PB:OFF
Q1
ES
E-E AMP
AGC DET
L3
C29
C28
R21
R22
Q5
EP:ON(H)
SP:OFF(L)
REC
PB
From 10 AUDIO IN/OUT CN6
NORMAL AUDIO
Q23
TP32
TP31
CN5
R8
REC/PLAY
R9
BIAS ADJ
E-E
D8
Q3
PB:ON(H)
REC:OFF(L)
From 04 MECHACON CN7
PB AMP
C24
R20
C63
SP:OFF(L)
EP:ON(H)
Q7
C33
C34
R27
Q6
R28
PB LEVEL
5V Vcc
Q103
IC101
5V REG
IC1-11(Vcc)
Q31
REG
From 04 MECHACON CN7
SP
From 02 SWITCHING POWER SUPPLY (2) CN13
CN1
SWD 12V
SEMIREG 7V
POWER ON/OFF
Q8
Q9
Q27
T1,Q2
BIAS OSC
D22
TP34
FULL ERACE
T2,Q18
Q17
D15
D17
AUDIO DUB
REC START
AUDIO BIAS
D14
D11
D10
CN4
A/E
FULL ERASE
From 04 MECHACON,CN8
SPCL CASS

3.12 SWITCHING POWER SUPPLY (1) AND SWITCHING POWER SUPPLY (2) SCHEMATIC DIAGRAMS

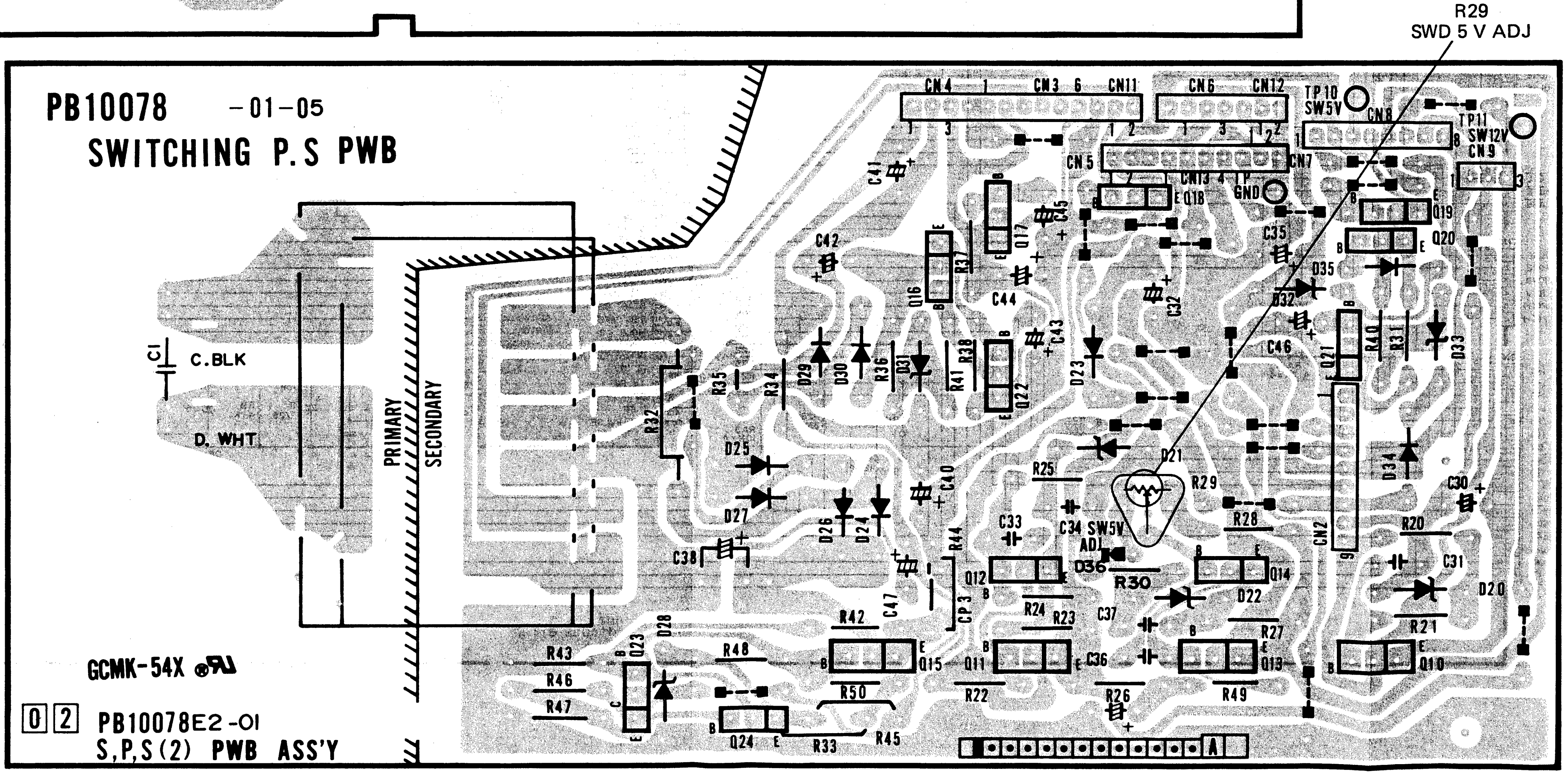

01 SWITCHING POWER SUPPLY(1)
02 SWITCHING POWER SUPPLY(2)
Q15 2SD1764
Q16 2SB1186 (DE)
Q22 2SA933S
Q19 DTA114ES
Q18 DTB114ES
Q20 DTA143XS
Q21 DTC143ES
Q17 2SA720
AC OUTLET 300W MAX
UNSW/SWD
A
B
C
D
RY1
D15
F1 1.0A
L2
C2 0.033 /125
C1 0.01 /125
AC120V 60Hz
R8 2.2M
C3 0.0022 /125
C4 0.0022/125
R1 1 2W
D3 D4 D1 D2
C10 150/200
C5 0.001/125
D1~D4 10E4
IC1
R2 150K
C12 120P
R3 150K
R4 68K 2W
R5 330K
D5 RU1A
D9 RU1A
C11 0.0047/1KV
C13 0.0022
R6 180 2W
C14 0.47
R9 360 2W
D6 AU01Z
Q1
PHC1 PC817
R7 0.33 2W
C15 180/50
D8 EK04
R100 100
R100 SEMI REG 15V ADJ
IC1 STR15006
Q1 DTD114ES
T1
T2
D13 FMB-24
F10 4.0A
L12 33
C23 4700/10
C24 1000/10
PHC1
D10 FML-12S
F11 4.0A
L11 33
L10 33
C25 0.01
C20 3300/16
C21 1000/16
C22 1000/16
CN1
POWER ON
GND
AC ONLINE
SEMIREG 7V
GND
GND
15V
GND(M)
15V(M)
CN10
SEMI REG 7V
GND
To 16 SIGNAL SELECTOR CN7
D29 11E2
R35 22 1/4W
D30 11E2
C41 47/63
C42 47/63
R34 15K
Q16
R36 10K
R41 470
R38 10
Q22
C43 22/50
D31 HZS33EB1
R37 2.2K
C44 22/50
C45 22/50
Q17
R32 1.8 1/2W
D24
D26
D25
D27
D24~27 = 11E2
C38 1000/25
C47 10/50
Q15
CP3 ICP-F20
R33 3.9K
R48 330
D28 MTZ15A
C40 100/16
Q19
Q18
R51 3.3K
Q20
R31 1K
D35
Q21
R40 39K
C46 100/16
D33 MTZ20C
D34
D23
R29 +5V ADJ
D32 MTZ7.5C
Q13
R27 470
C36 0.01
R28 560
C35 100/10
R49 1K
Q14
R29 330
C48 10/16
R26 560
D22
D36
R30 1.8K
D22: HZ4A3
D36: MA27TA
CN2
Q11
R22 1K
R23 1.2K
C33 0.01
R24 2.7K
C32 100/16
Q12
D21 MTZ6.8B
R25 3.9K
Q10
R20 680
R21 330
D20 MTZ13C
C30 47/16
Q13, Q11, Q10 2SD1764
Q14, Q12 2SC1740S(QRS)
CN3 GND -30V AC 5V AC 5V GND -30V
From/To 27 DISPLAY CN1
CN11 AC ONLINE GND
From 37 STEP CN6
CN4 45V GND
To 08 TUNER CTL CN1
CN5 UNSW 12V GND
From/To 10 AUDIO IN/OUT CN2
CN13 SEMIREG 7V GND SWD 12V POWER ON/OFF
From/To 09 AUDIO CN1
CN6 SWD 5V GND SWD 12V
From/To 03 MAIN (VIDEO) CN3
CN12 SWD 5V GND
From/To 43 PRE/REC AMP CN3
CN7 SWD 12V GND
From/To 46 FLYING ERASE CN2
CN8 GND UNSW 12V SWD 5V POWER ON/OFF MOTOR 12V SWD 12V GND(M) SEMIREG 15V
From/To 04 MECHACON CN16
CN9 SEMIREG 15V GND(M) MOTOR 12V
From/To 03 MAIN (SERVO) CN402
6
5
4
3
2
1
A
B
C
D
E
F
G
H

3.13 SWITCHING POWER SUPPLY (1) AND SWITCHING POWER SUPPLY (2) CIRCUIT BOARDS

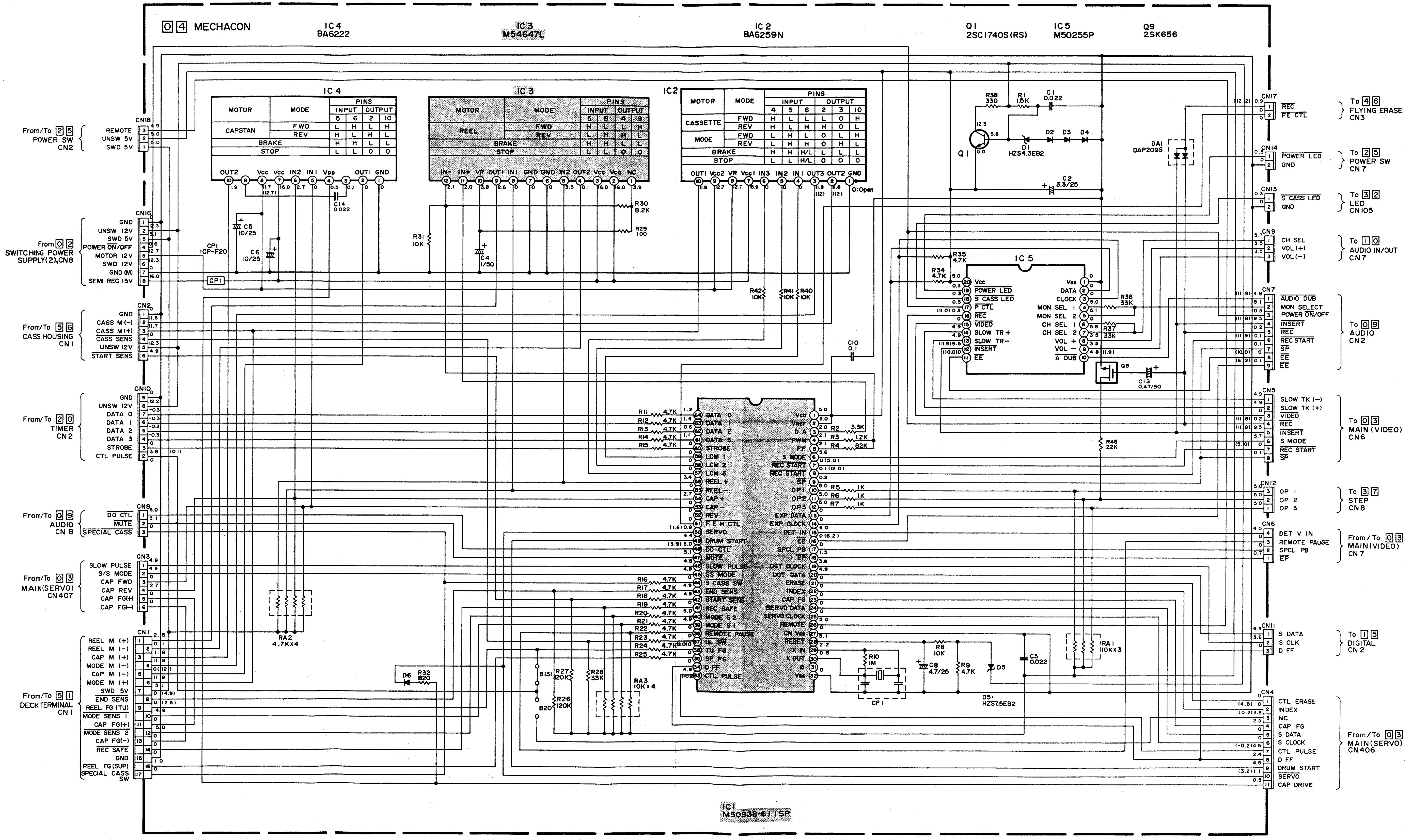
– SWITCHING POWER SUPPLY (1) –


R100
SEMIREG 15 V ADJ
PB110078 -01-05
SWITCHING P.S PWB
GCMK-54X
FUSE 1
C
BLK
D
WHT
L2
2. NEUTRAL
3. NEUTRAL
1. LIVE
A
RY1
R8
GND.
D15
D2
D1
D3
D4
C5
C4
C2
C3
R1
C10
C11
C12
D9
D5
R4
R2
R3
R7
R5
R6
R9
C13
C14
C15
D6
D7
D8
IC1
PHC1
EQ1
L12
C24
CN10
C23
CN1
FUSE10
L11
D13
C22
C20
C21
FUSE11
L10
C25
D10
T1
SECONDARY
PRIMARY
01 PB10078E1-01
S,P,S(1) PWB ASS'Y

– SWITCHING POWER SUPPLY (2) –


R29
SWD 5 V ADJ
PB10078 -01-05
SWITCHING P.S PWB
C1
C.BLK
D. WHT
PRIMARY
SECONDARY
GCMK-54X
02 PB10078E2-01
S,P,S(2) PWB ASS'Y
CN4
CN3
CN11
CN6
CN12
TP10
SW5V
CN8
TP11
SW12V
CN9
CN5
CN7
CN13
TP
GND
Q18
Q19
Q20
C41
C42
C45
C35
D35
D32
C44
C43
C32
C46
Q17
Q16
Q22
Q21
R40
R31
D33
D34
D23
R35
R34
R32
D29
D30
R36
D31
R38
R41
D25
D27
D26
D24
C40
R25
D21
C30
CN2
C38
R44
C33
C34
SW5V
ADJ
D36
R30
R28
R20
C31
D20
Q12
Q14
D22
C47
CP3
R42
R24
R23
C37
R27
R21
D28
R43
R46
R47
Q23
R48
Q15
Q11
C36
Q13
Q10
R22
R26
R49
R50
Q24
R33
R45
A

3.14 MECHANISM CONTROL SCHEMATIC DIAGRAM



04 MECHACON
IC4 BA6222
IC3 M54647L
IC2 BA6259N
Q1 2SC1740S(RS)
IC5 M50255P
Q9 2SK656
IC1 M50938-611SP
From/To 25 POWER SW CN2
From 02 SWITCHING POWER SUPPLY(2),CN8
From/To 56 CASS HOUSING CN1
From/To 20 TIMER CN2
From/To 09 AUDIO CN8
From/To 03 MAIN(SERVO) CN407
From/To 51 DECK TERMINAL CN1
To 46 FLYING ERASE CN3
To 25 POWER SW CN7
To 32 LED CN105
To 10 AUDIO IN/OUT CN7
To 09 AUDIO CN2
To 03 MAIN(VIDEO) CN6
To 37 STEP CN8
From/To 03 MAIN(VIDEO) CN7
To 15 DIGITAL CN2
From/To 03 MAIN(SERVO) CN406
CN18
CN16
CN2
CN10
CN8
CN3
CN1
CN17
CN14
CN13
CN9
CN7
CN5
CN12
CN6
CN11
CN4
CP1 ICP-F20
RA2 4.7K×4
RA3 10K×4
RA1 10K×3
CF1
D1 HZS4.3EB2
D5 HZS7.5EB2
DA1 DAP209S
O: Open

IC4

MOTOR	MODE	PINS			
		INPUT		OUTPUT	
		5	6	2	10
CAPSTAN	FWD	L	H	L	H
	REV	H	L	H	L
BRAKE		H	H	L	L
STOP		L	L	O	O

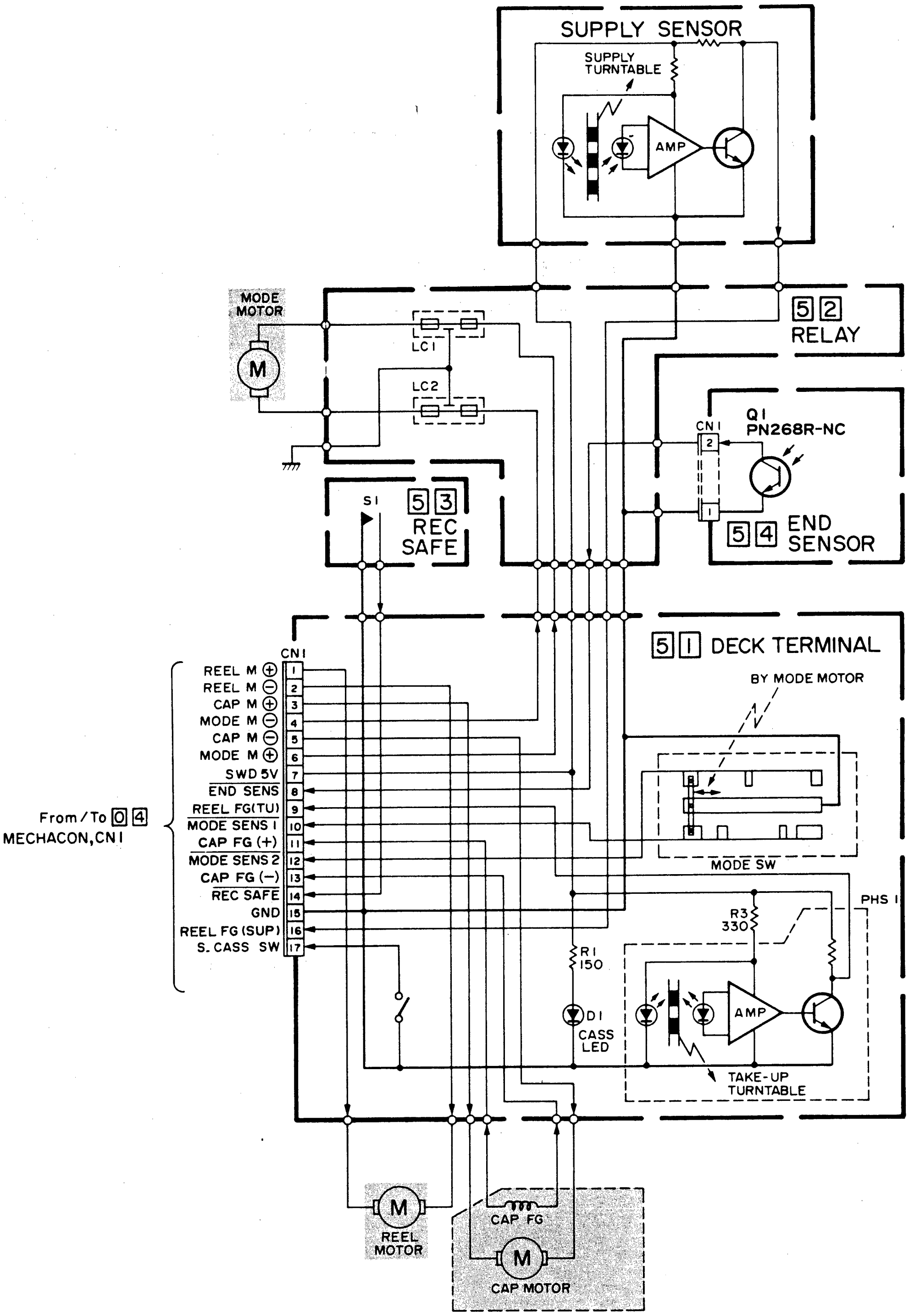
IC3

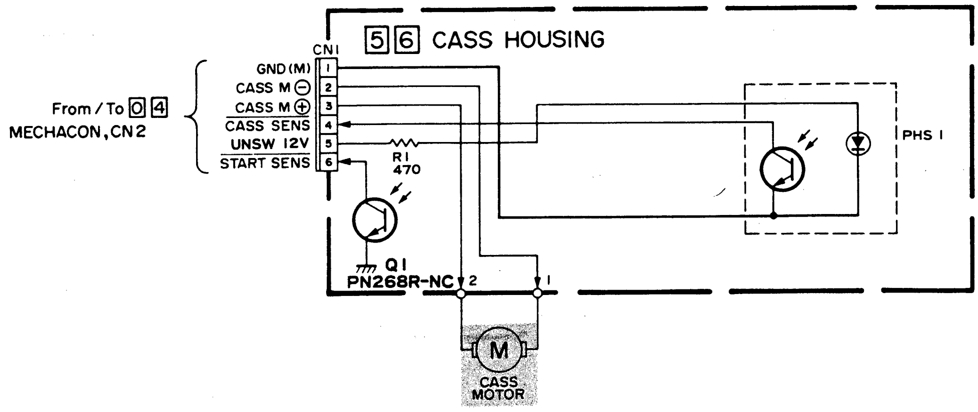
MOTOR	MODE	PINS			
		INPUT		OUTPUT	
		5	8	4	9
REEL	FWD	H	L	L	H
	REV	L	H	H	L
BRAKE		H	H	L	L
STOP		L	L	O	O

IC2

MOTOR	MODE	PINS					
		INPUT			OUTPUT		
		4	5	6	2	3	10
CASSETTE	FWD	H	L	L	L	O	H
	REV	H	L	H	H	O	L
MODE	FWD	L	H	L	O	L	H
	REV	L	H	H	O	H	L
BRAKE		H	H	H/L	L	L	L
STOP		L	L	H/L	O	O	O

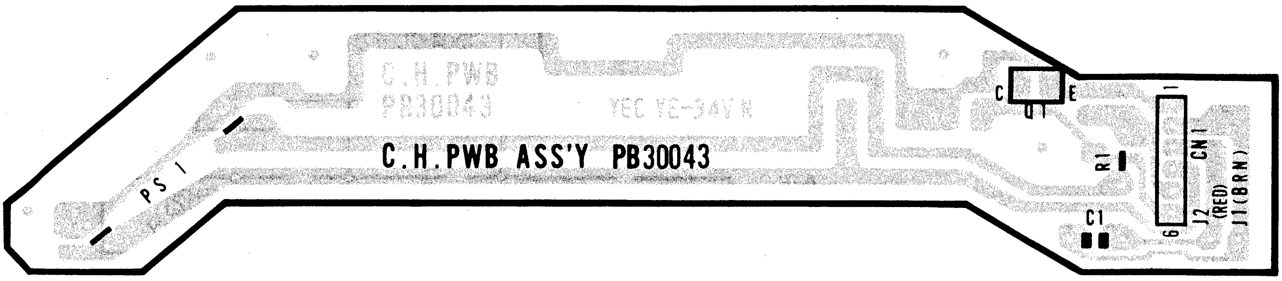
3.15 DECK TERMINAL SCHEMATIC DIAGRAMS


SUPPLY SENSOR
SUPPLY TURNTABLE
AMP
MODE MOTOR
M
LC1
LC2
52 RELAY
Q1 PN268R-NC
CN1
2
1
54 END SENSOR
S1
53 REC SAFE
51 DECK TERMINAL
BY MODE MOTOR
MODE SW
PHS 1
R3 330
R1 150
D1 CASS LED
AMP
TAKE-UP TURNTABLE
From/To 04 MECHACON, CN1
CN1
REEL M ⊕ 1
REEL M ⊖ 2
CAP M ⊕ 3
MODE M ⊖ 4
CAP M ⊖ 5
MODE M ⊕ 6
SWD 5V 7
END SENS 8
REEL FG(TU) 9
MODE SENS 1 10
CAP FG (+) 11
MODE SENS 2 12
CAP FG (−) 13
REC SAFE 14
GND 15
REEL FG (SUP) 16
S. CASS SW 17
M
REEL MOTOR
CAP FG
M
CAP MOTOR

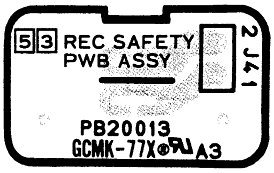

56 CASS HOUSING
CN1
From/To 04 MECHACON, CN2
GND (M) 1
CASS M ⊖ 2
CASS M ⊕ 3
CASS SENS 4
UNSW 12V 5
START SENS 6
R1 470
PHS 1
Q1 PN268R-NC
2
1
M
CASS MOTOR

3.16 MECHANISM CONTROL AND DECK TERMINAL CIRCUIT BOARDS

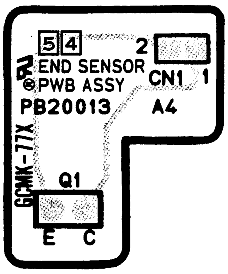
– CASSETTE HOUSING –


C.H.PWB
PB30043
YEC YE-34VN
C.H.PWB ASS'Y PB30043
PS1
C
Q1
E
R1
CN1
1
6
J2 (RED)
J1 (BRN)
C1

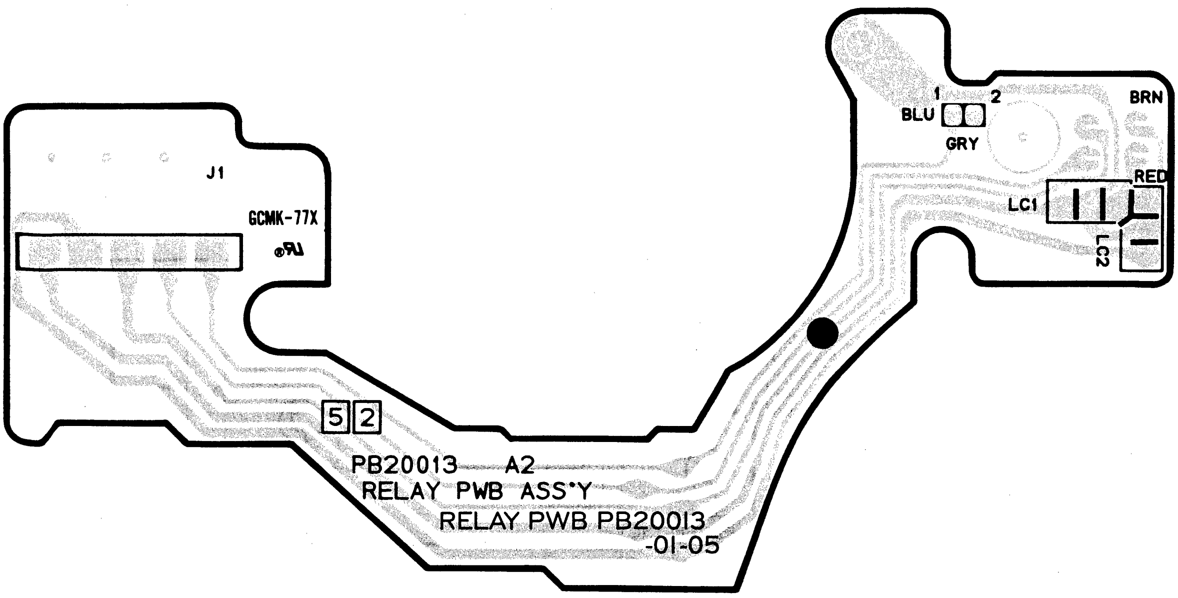
– REC SAFETY –


53 REC SAFETY
PWB ASSY
2 J41
PB20013
GCMK-77X A3

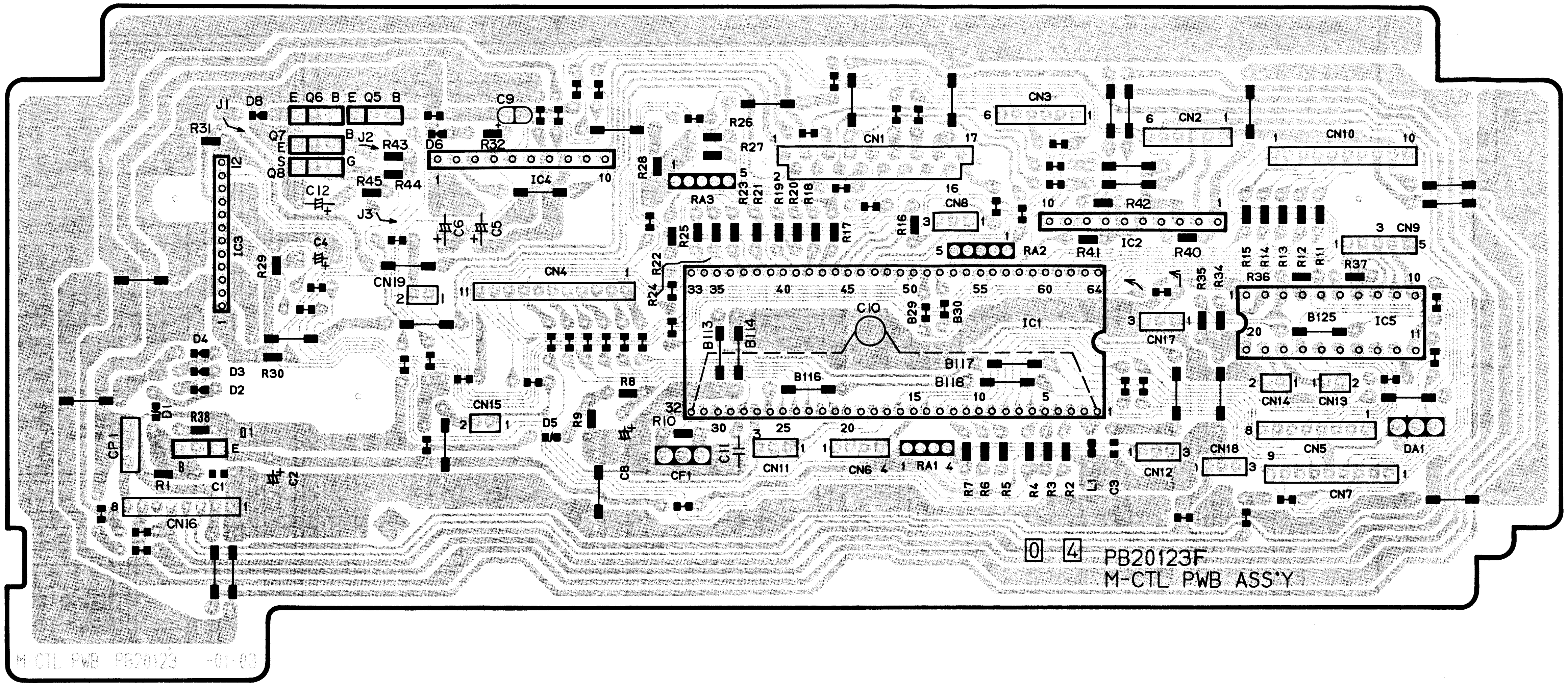
– END SENSOR –


54
END SENSOR
PWB ASSY
2
CN1
1
PB20013
A4
GCMK-77X
Q1
E
C

– RELAY –

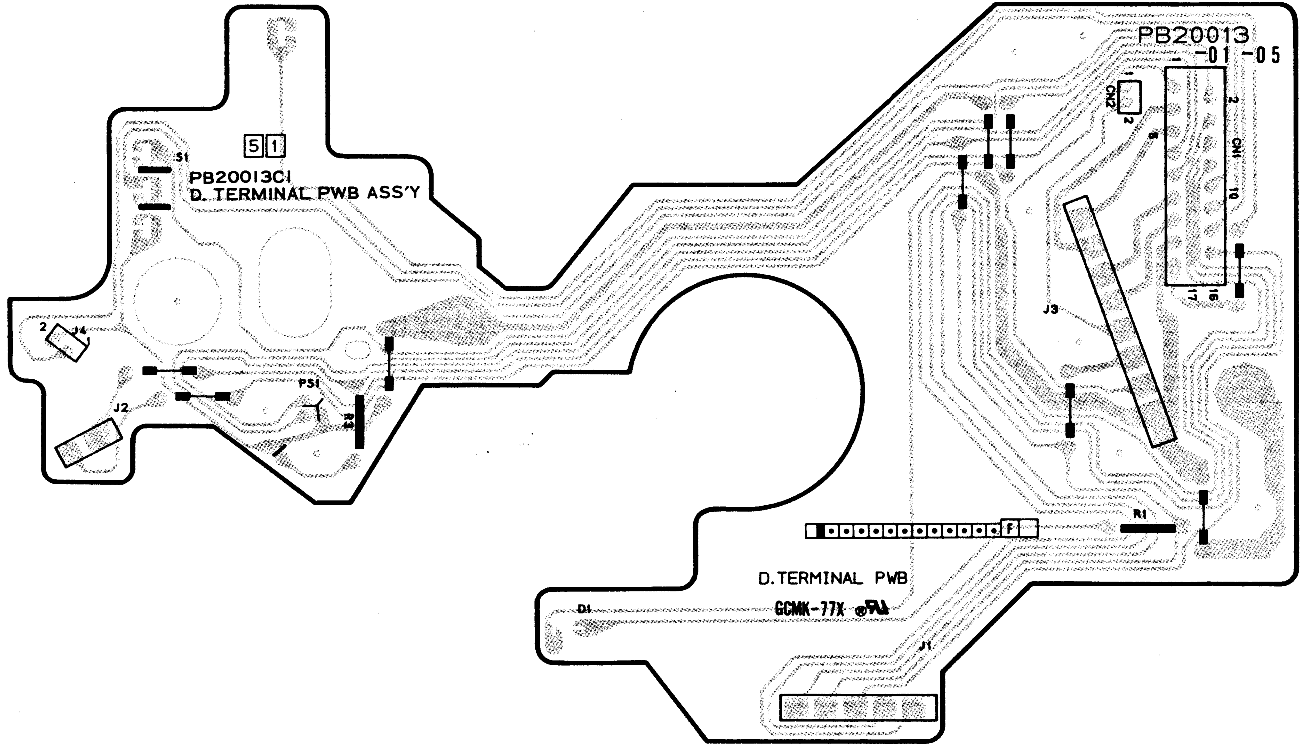

J1
GCMK-77X
1
2
BLU
GRY
BRN
RED
LC1
LC2
52
PB20013 A2
RELAY PWB ASS'Y
RELAY PWB PB20013
-01-05

– MECHANISM CONTROL –



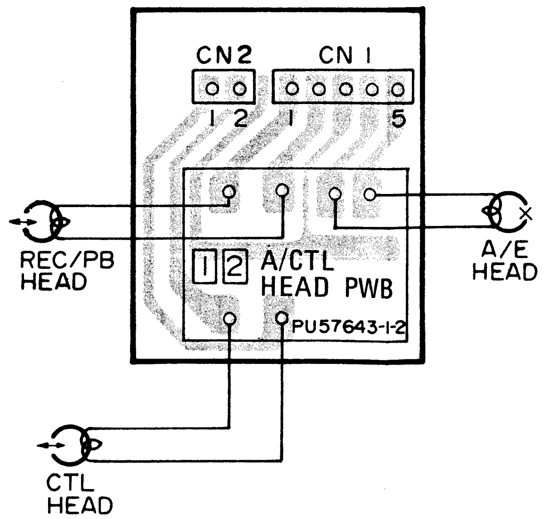
0 4 PB20123F
M-CTL PWB ASS'Y
M-CTL PWB PB20123 -01-03
IC1
IC2
IC3
IC4
IC5
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
CN17
CN18
CN19
RA1
RA2
RA3
CF1
DA1
CP1
C10

– DECK TERMINAL –

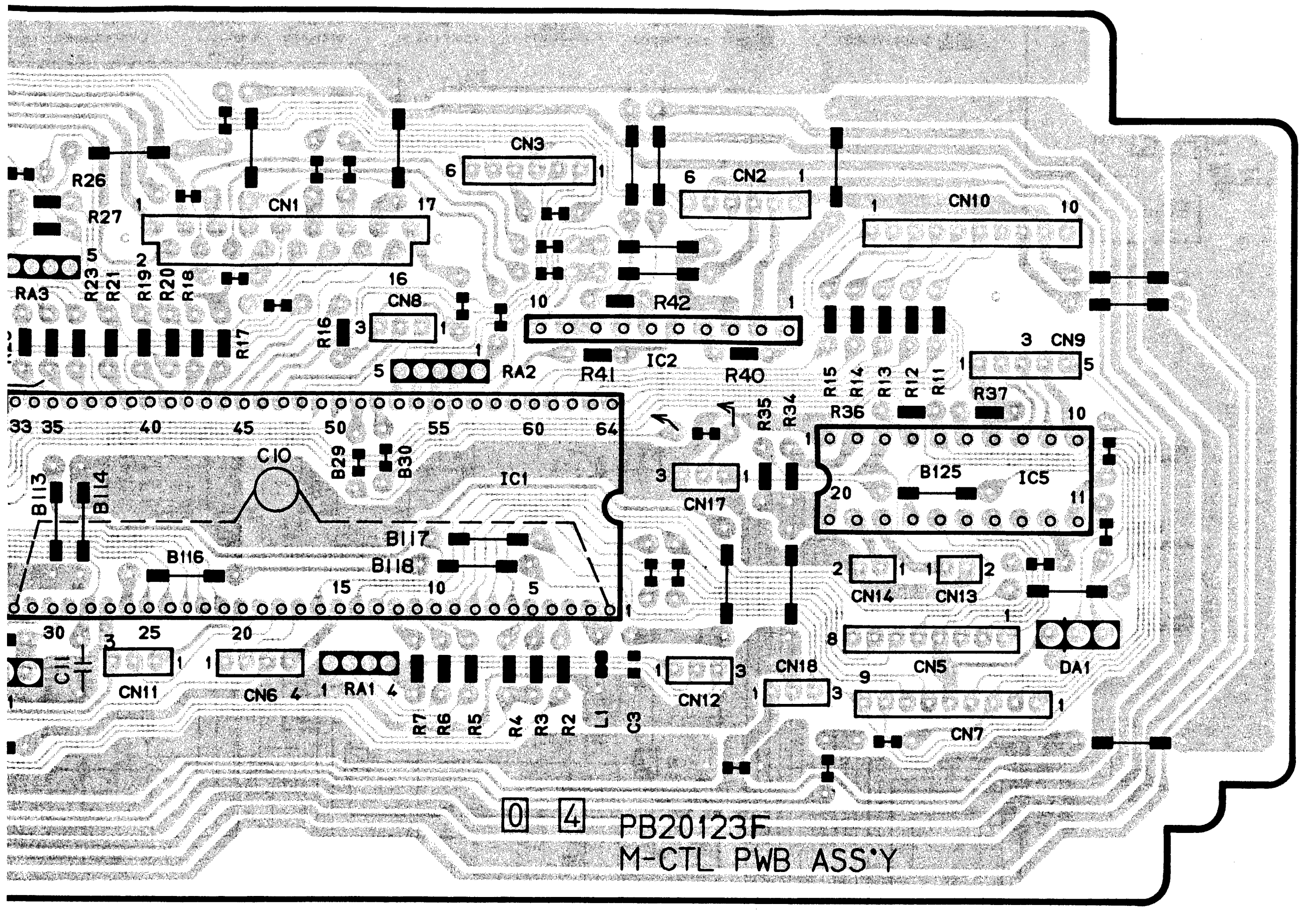


PB20013 -01 -05
5 1
PB20013C1
D. TERMINAL PWB ASS'Y
D.TERMINAL PWB
GCMK-77X
CN1
CN2
J1
J2
J3
R1
D1

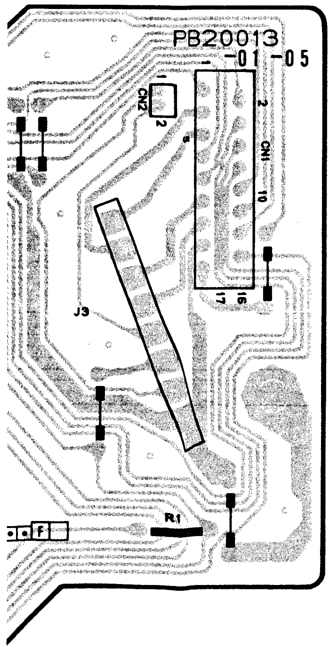
– A/CTL HEAD –



CN2
CN 1
1 2
1
5
REC/PB HEAD
A/E HEAD
1 2 A/CTL HEAD PWB
PU57643-1-2
CTL HEAD

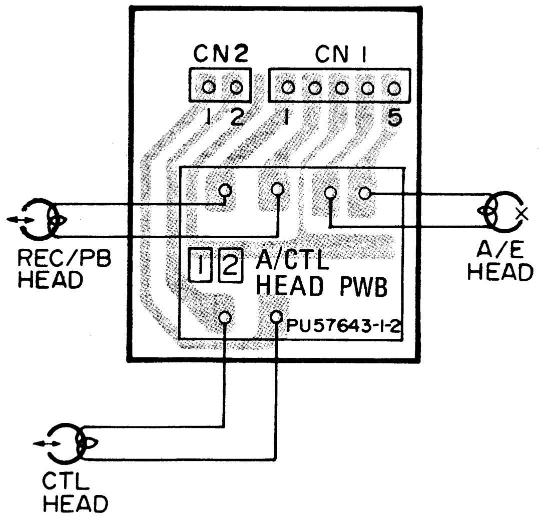


CN3
CN2
CN10
CN1
CN8
CN9
R26
R27
R42
R41
IC2
R40
RA2
RA3
R23
R21
R19
R20
R18
R17
R16
R15
R14
R13
R12
R11
R37
R36
R35
R34
IC1
IC5
C10
B29
B30
B113
B114
B116
B117
B118
B125
CN17
CN14
CN13
CN5
DA1
CN11
CN6
RA1
CN12
CN18
CN7
C11
R7
R6
R5
R4
R3
R2
L1
C3
0 4 PB20123F
M-CTL PWB ASS'Y



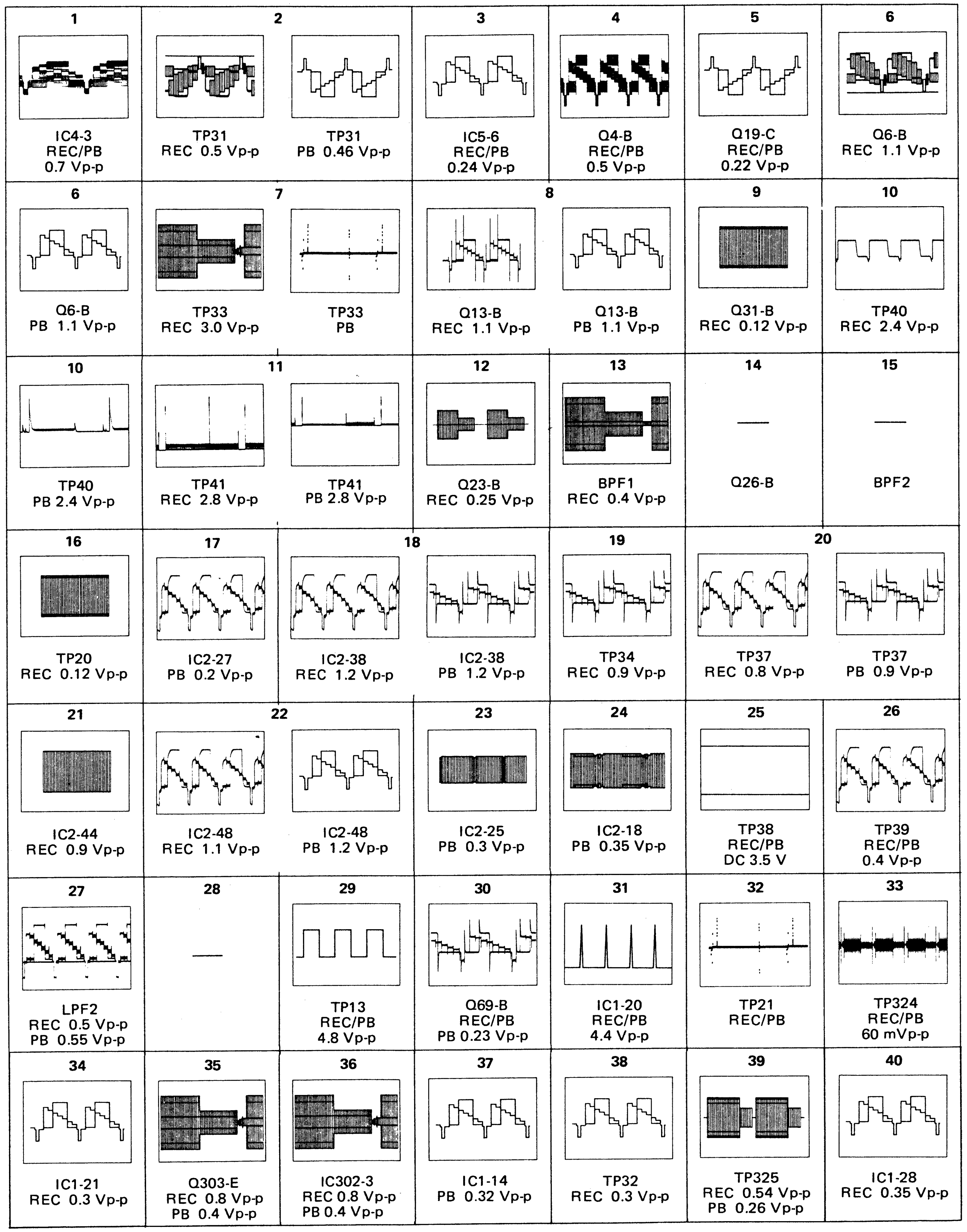
PB20013
-01 -05
CN2
CN1
J3
R1

– A/CTL HEAD –



CN2
CN 1
1 2
1
5
REC/PB
HEAD
A/E
HEAD
1 2 A/CTL
HEAD PWB
PU57643-1-2
CTL
HEAD

— Waveforms of VIDEO circuir —


1 IC4-3 REC/PB 0.7 Vp-p

2 TP31 REC 0.5 Vp-p

TP31 PB 0.46 Vp-p

3 IC5-6 REC/PB 0.24 Vp-p

4 Q4-B REC/PB 0.5 Vp-p

5 Q19-C REC/PB 0.22 Vp-p

6 Q6-B REC 1.1 Vp-p

6 Q6-B PB 1.1 Vp-p

7 TP33 REC 3.0 Vp-p

TP33 PB

8 Q13-B REC 1.1 Vp-p

Q13-B PB 1.1 Vp-p

9 Q31-B REC 0.12 Vp-p

10 TP40 REC 2.4 Vp-p

10 TP40 PB 2.4 Vp-p

11 TP41 REC 2.8 Vp-p

TP41 PB 2.8 Vp-p

12 Q23-B REC 0.25 Vp-p

13 BPF1 REC 0.4 Vp-p

14 — Q26-B

15 — BPF2

16 TP20 REC 0.12 Vp-p

17 IC2-27 PB 0.2 Vp-p

18 IC2-38 REC 1.2 Vp-p

IC2-38 PB 1.2 Vp-p

19 TP34 REC 0.9 Vp-p

20 TP37 REC 0.8 Vp-p

TP37 PB 0.9 Vp-p

21 IC2-44 REC 0.9 Vp-p

22 IC2-48 REC 1.1 Vp-p

IC2-48 PB 1.2 Vp-p

23 IC2-25 PB 0.3 Vp-p

24 IC2-18 PB 0.35 Vp-p

25 TP38 REC/PB DC 3.5 V

26 TP39 REC/PB 0.4 Vp-p

27 LPF2 REC 0.5 Vp-p PB 0.55 Vp-p

28 —

29 TP13 REC/PB 4.8 Vp-p

30 Q69-B REC/PB PB 0.23 Vp-p

31 IC1-20 REC/PB 4.4 Vp-p

32 TP21 REC/PB

33 TP324 REC/PB 60 mVp-p

34 IC1-21 REC 0.3 Vp-p

35 Q303-E REC 0.8 Vp-p PB 0.4 Vp-p

36 IC302-3 REC 0.8 Vp-p PB 0.4 Vp-p

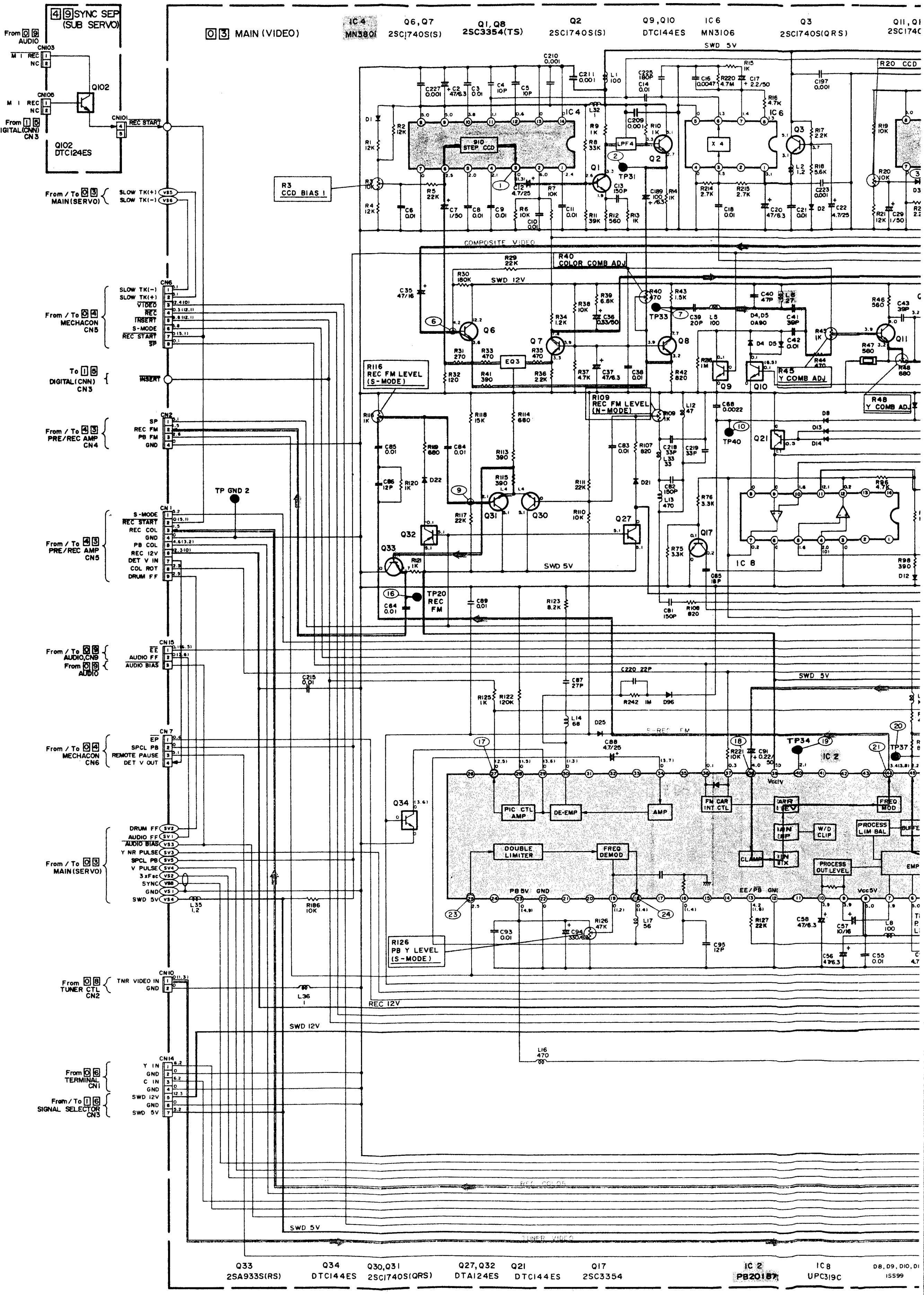
37 IC1-14 PB 0.32 Vp-p

38 TP32 REC 0.3 Vp-p

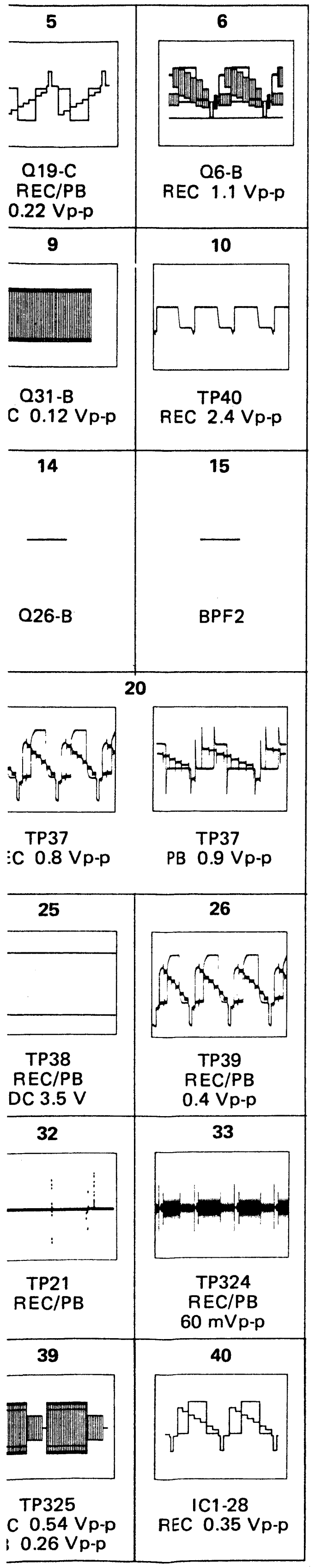
39 TP325 REC 0.54 Vp-p PB 0.26 Vp-p

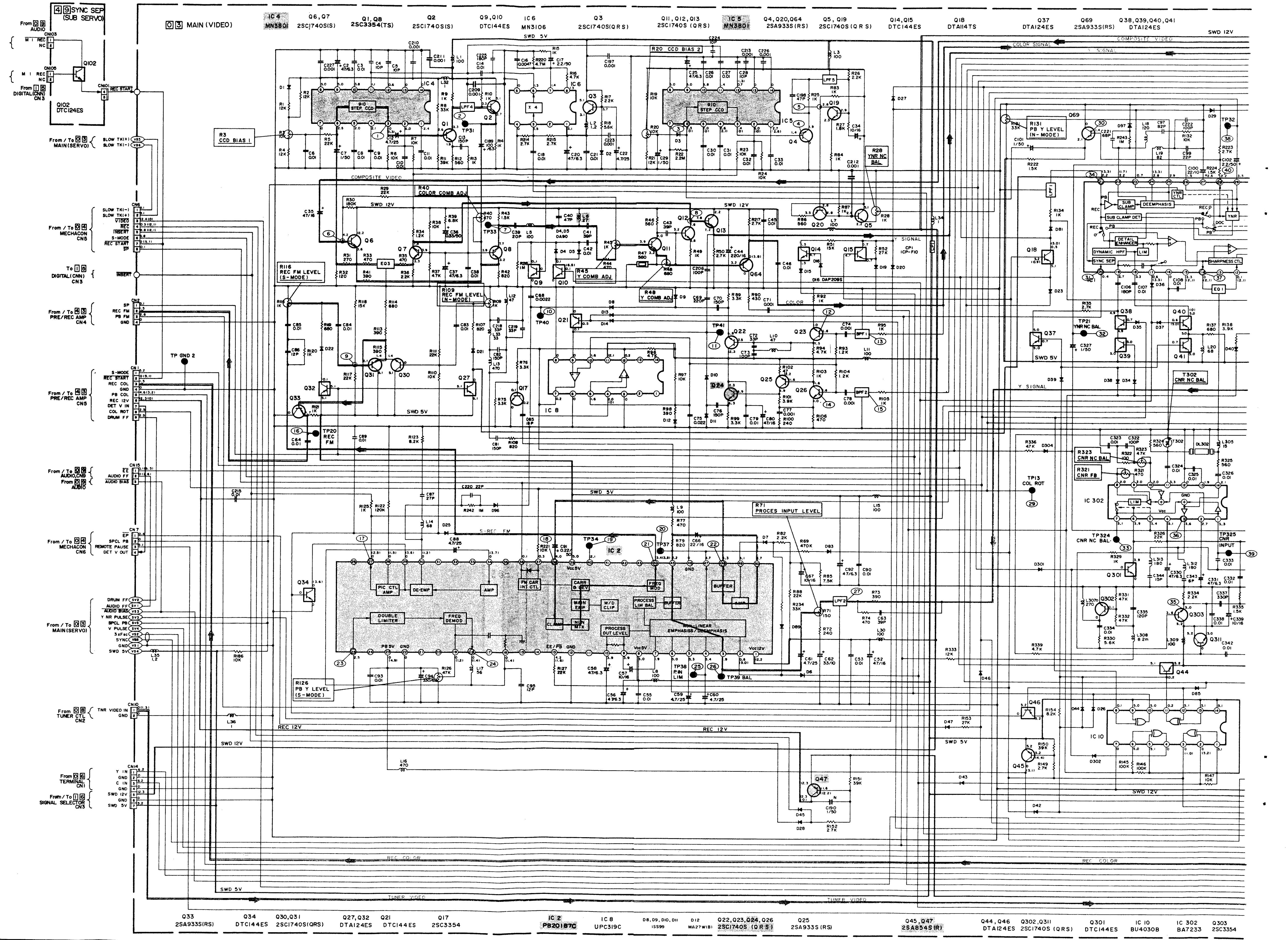
40 IC1-28 REC 0.35 Vp-p

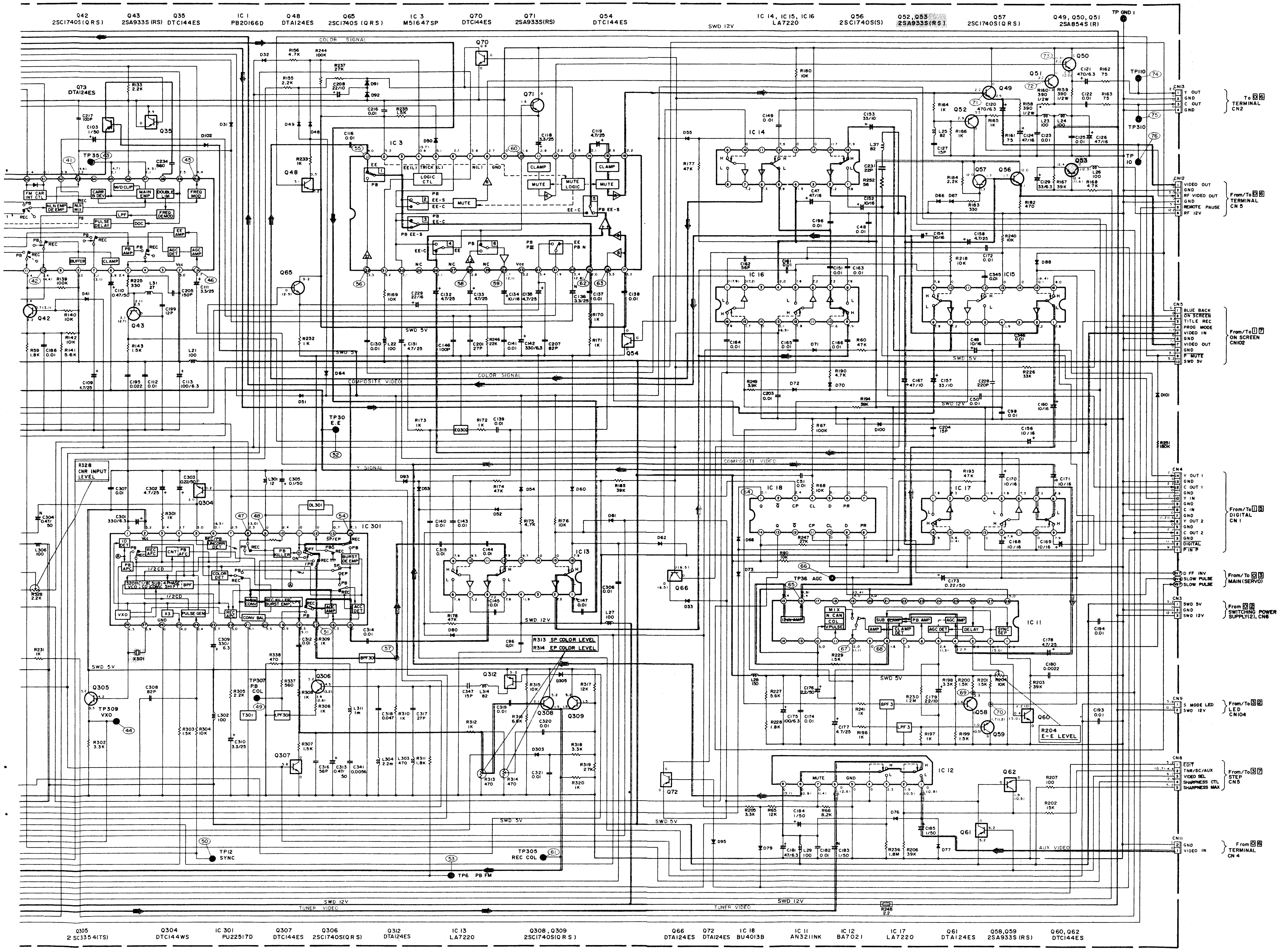
3.17 VIDEO (REC) SCHEMATIC DIAGRAM

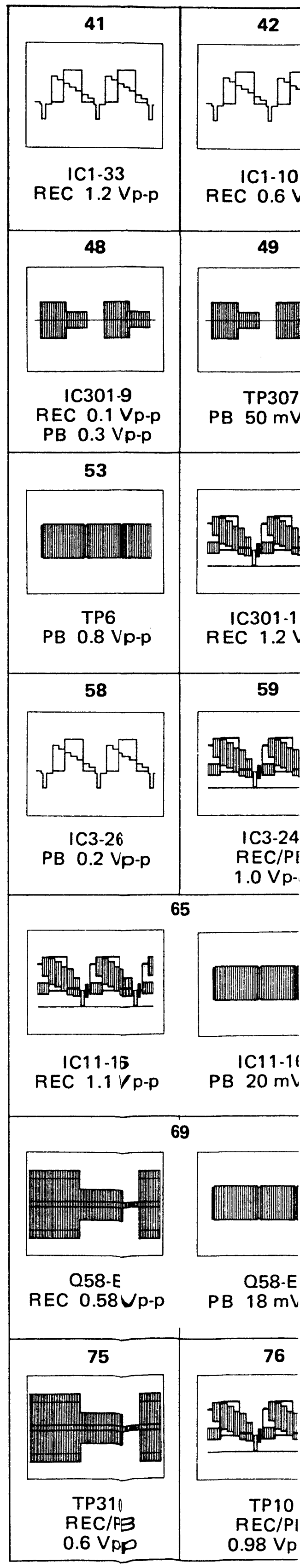

49 SYNC SEP (SUB SERVO)
03 MAIN (VIDEO)
IC4 MN3801
Q6,Q7 2SC1740S(S)
Q1,Q8 2SC3354(TS)
Q2 2SC1740S(S)
Q9,Q10 DTC144ES
IC6 MN3106
Q3 2SC1740S(QRS)
Q102 DTC124ES
R3 CCD BIAS I
R40 COLOR COMB ADJ
R116 REC FM LEVEL (S-MODE)
R109 REC FM LEVEL (N-MODE)
R45 Y COMB ADJ
R48 Y COMB ADJ
R126 PB Y LEVEL (S-MODE)
COMPOSITE VIDEO
SWD 12V
SWD 5V
REC 12V
TP GND 2
From / To 03 MAIN(SERVO)
From / To 04 MECHACON CN5
To 18 DIGITAL(CNN) CN3
From / To 43 PRE/REC AMP CN4
From / To 43 PRE/REC AMP CN5
From / To 04 MECHACON CN6
From / To 03 MAIN(SERVO)
From 08 TUNER CTL CN2
From 16 TERMINAL CN1
From / To 16 SIGNAL SELECTOR CN3
IC 2
IC 8
Q33 2SA933S(RS)
Q34 DTC144ES
Q30,Q31 2SC1740S(QRS)
Q27,Q32 DTA124ES
Q21 DTC144ES
Q17 2SC3354
IC 2 PB20187
IC8 UPC319C
D8,D9,D10,D1 1SS99

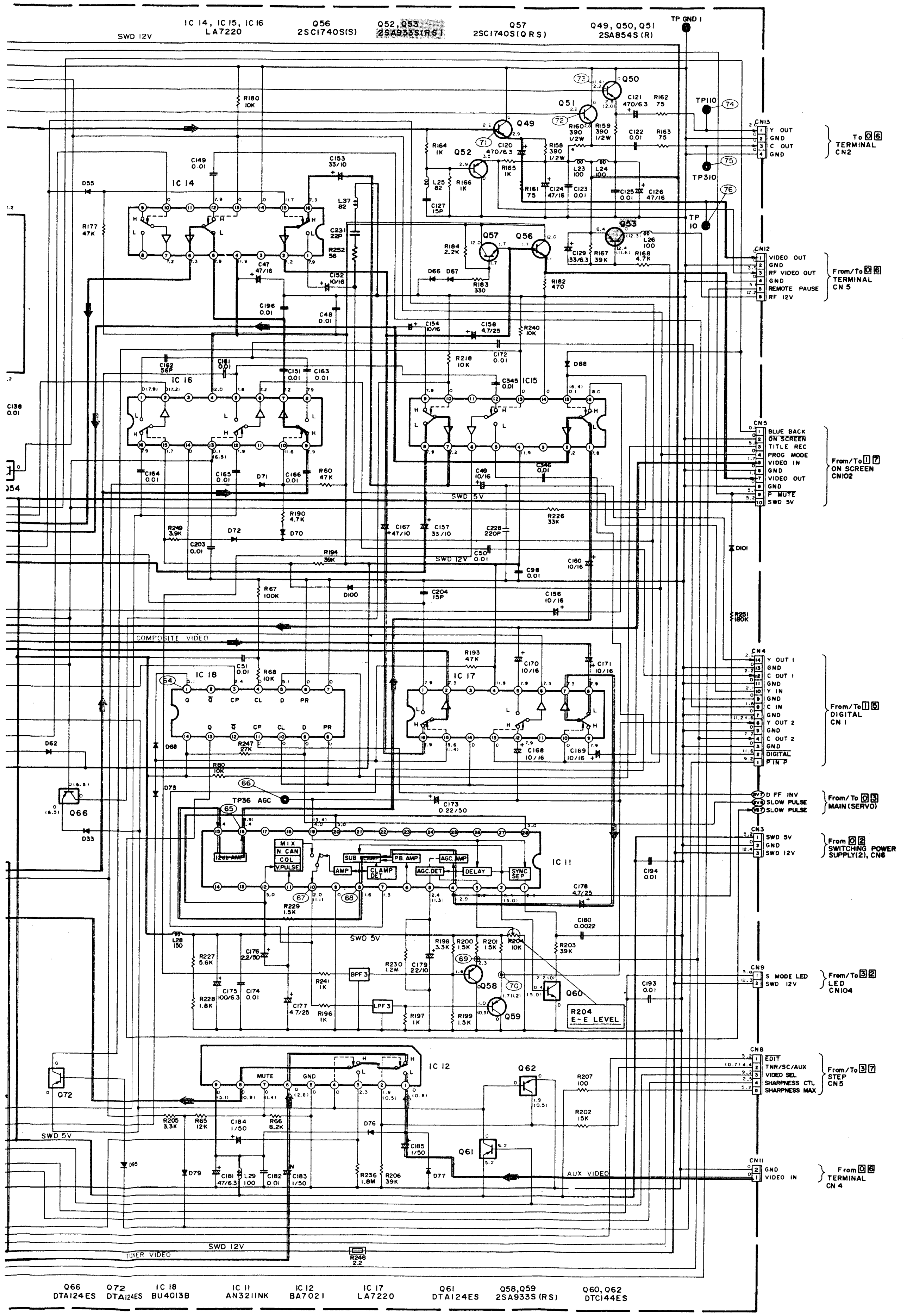
3.17 VIDEO (REC) SCHEMATIC DIAGRAM



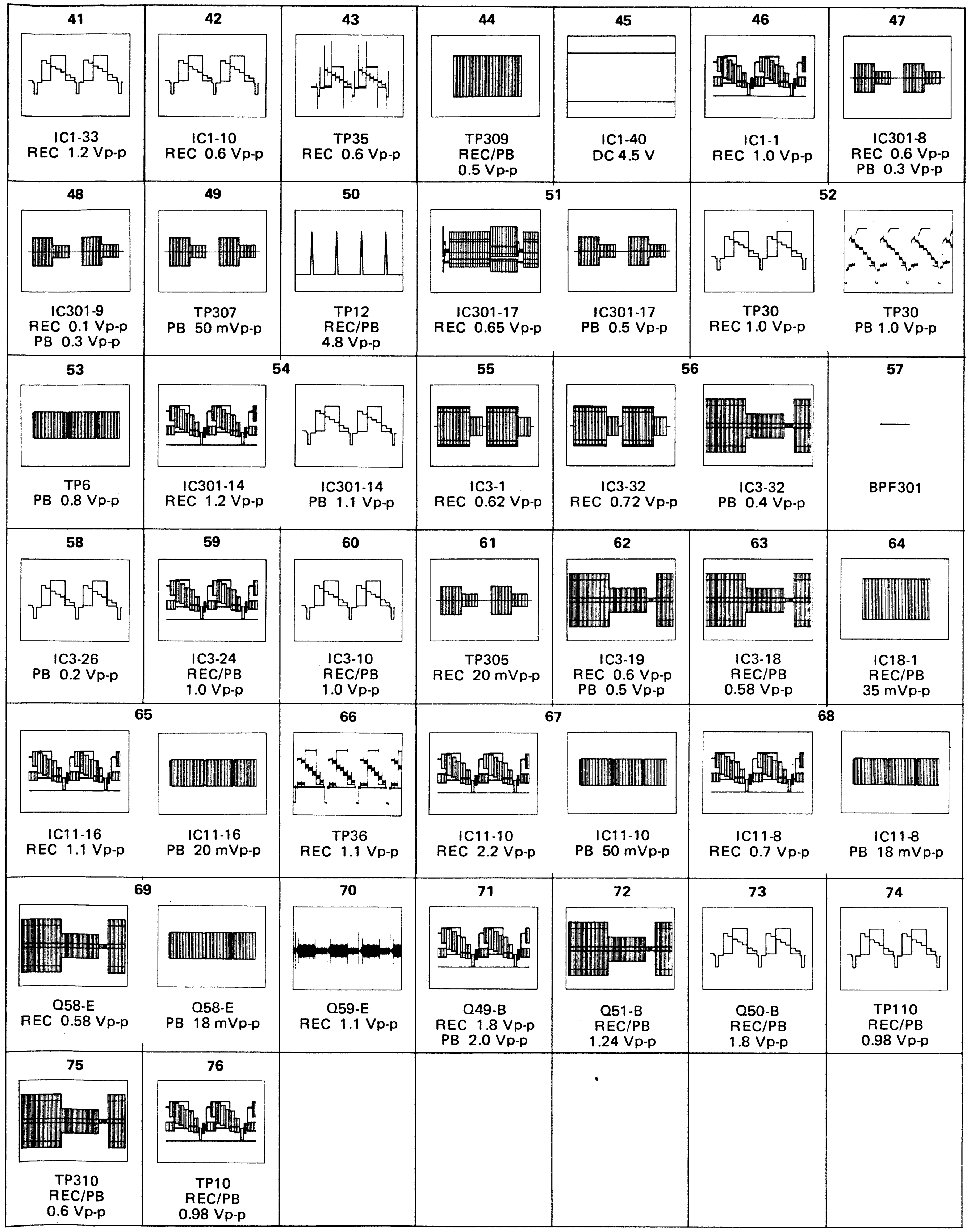

SYNC SEP (SUB SERVO)
Q102 DTC124ES
REC START
MAIN (VIDEO)
IC 4 MN3801
Q6, Q7 2SC1740S(S)
Q1, Q8 2SC3354(TS)
Q2 2SC1740S(S)
Q9, Q10 DTC144ES
IC6 MN3106
Q3 2SC1740S(QRS)
Q11, Q12, Q13 2SC1740S (QRS)
IC 5 MN3801
Q4, Q20, Q64 2SA933S(RS)
Q5, Q19 2SC1740S (Q R S)
Q14, Q15 DTC144ES
Q18 DTA114TS
Q37 DTA124ES
Q69 2SA933S(RS)
Q38, Q39, Q40, Q41 DTA124ES
SWD 12V
SWD 5V
COLOR SIGNAL
COMPOSITE VIDEO
Y SIGNAL
R3 CCD BIAS 1
R20 CCD BIAS 2
R40 COLOR COMB ADJ
R45 Y COMB ADJ
R48 Y COMB ADJ
R116 REC FM LEVEL (S-MODE)
R109 REC FM LEVEL (N-MODE)
R28 YNR NC BAL
R131 PB Y LEVEL (N-MODE)
R71 PROCES INPUT LEVEL
R126 PB Y LEVEL (S-MODE)
R323 CNR NC BAL
R321 CNR FB
T302 CNR NC BAL
TP21 YNR NC BAL
TP13 COL ROT
TP324 CNR NC BAL
TP325 CNR INPUT
TP20 REC FM
TP GND 2
TP33
TP31
TP34
TP37
TP38 P.IN LIM
TP39 BAL
TP40
IC 2
IC 8
IC 302
IC 10
SUB CLAMP
DEEMPHASIS
SUB CLAMP DET
DETAIL ENHANCER
DYNAMIC HPF
SYNC SEP
SHARPNESS CTL
LIM
YNR
YNR CTL
PIC CTL AMP
DE-EMP
AMP
FM CAR INT CTL
CARR DEV
FREQ MOD
BUFFER
DOUBLE LIMITER
FREQ DEMOD
MAIN EMP
W/D CLIP
PROCESS LIM BAL
CLAMP
NON MIX
PROCESS OUT LEVEL
NON-LINEAR EMPHASISS/DEEMPHASIS
S-REC FM
REC COLOR
REC 12V
TUNER VIDEO
From / To MAIN (SERVO)
From / To MECHACON CN5
To DIGITAL (CNN) CN3
From / To PRE/REC AMP CN4
From / To PRE/REC AMP CN5
From / To AUDIO CN9
From AUDIO
From / To MECHACON CN6
From / To MAIN (SERVO)
From TUNER CTL CN2
From TERMINAL CN1
From / To SIGNAL SELECTOR CN3
Q33 2SA933S(RS)
Q34 DTC144ES
Q30, Q31 2SC1740S(QRS)
Q27, Q32 DTA124ES
Q21 DTC144ES
Q17 2SC3354
IC 2 PB2018C
IC 8 UPC319C
D8, D9, D10, D11 1S599
D12 MA27W1B1
Q22, Q23, Q24, Q26 2SC1740S (QRS)
Q25 2SA933S (RS)
Q45, Q47 2SA854S(R)
Q44, Q46 DTA124ES
Q302, Q311 2SC1740S (QRS)
Q301 DTC144ES
IC 10 BU4030B
IC 302 BA7233
Q303 2SC3354


Q42 2SC1740S(QRS)
Q43 2SA933S(RS)
Q35 DTC144ES
IC1 PB20166D
Q48 DTA124ES
Q65 2SC1740S(QRS)
IC3 M51647SP
Q70 DTC144ES
Q71 2SA933S(RS)
Q54 DTC144ES
IC14, IC15, IC16 LA7220
Q56 2SC1740S(Q)
Q52, Q53 2SA933S(RS)
Q57 2SC1740S(QRS)
Q49, Q50, Q51 2SA854S(R)
TP GND 1
SWD 12V
COLOR SIGNAL
COMPOSITE VIDEO
Y SIGNAL
TUNER VIDEO
AUX VIDEO
SWD 5V
TP35
TP30 E.E
TP36 AGC
TP309 VXO
TP307 PB COL
TP12 SYNC
TP305 REC COL
TP6 PB FM
TP110
TP310
TP10
R328 CNR INPUT LEVEL
R313 SP COLOR LEVEL
R314 EP COLOR LEVEL
R204 E-E LEVEL
IC 301
IC 3
IC 11
IC 12
IC 13
IC 14
IC 15
IC 16
IC 17
IC 18
CN13 Y OUT GND C OUT GND
To 2 6 TERMINAL CN2
CN12 VIDEO OUT GND RF VIDEO OUT GND REMOTE PAUSE RF 12V
From/To 2 6 TERMINAL CN5
CN5 BLUE BACK ON SCREEN TITLE REC PROG MODE VIDEO IN GND VIDEO OUT GND P MUTE SWD 5V
From/To 1 7 ON SCREEN CN102
CN4 Y OUT 1 GND C OUT 1 GND Y IN GND C IN GND Y OUT 2 GND C OUT 2 GND DIGITAL P IN P
From/To 1 5 DIGITAL CN1
D FF INV SLOW PULSE SLOW PULSE
From/To 3 3 MAIN (SERVO)
CN3 SWD 5V GND SWD 12V
From 2 2 SWITCHING POWER SUPPLY(2), CN6
CN9 S MODE LED SWD 12V
From/To 3 2 LED CN104
CN8 EDIT TNR/SC/AUX VIDEO SEL SHARPNESS CTL SHARPNESS MAX
From/To 3 7 STEP CN5
CN11 GND VIDEO IN
From 2 6 TERMINAL CN4
Q305 2SC3354(TS)
Q304 DTC144WS
IC 301 PU22517D
Q307 DTC144ES
Q306 2SC1740S(QRS)
Q312 DTA124ES
IC 13 LA7220
Q308, Q309 2SC1740S(QRS)
Q66 DTA124ES
Q72 DTA124ES
IC 18 BU4013B
IC 11 AN3211NK
IC 12 BA7021
IC 17 LA7220
Q61 DTA124ES
Q58, Q59 2SA933S(RS)
Q60, Q62 DTC144ES


41
IC1-33 REC 1.2 Vp-p
42
IC1-10 REC 0.6 V
48
IC301-9 REC 0.1 Vp-p PB 0.3 Vp-p
49
TP307 PB 50 mV
53
TP6 PB 0.8 Vp-p
IC301-1 REC 1.2 V
58
IC3-26 PB 0.2 Vp-p
59
IC3-24 REC/PB 1.0 Vp-
65
IC11-15 REC 1.1 Vp-p
IC11-10 PB 20 mV
69
Q58-E REC 0.58 Vp-p
Q58-E PB 18 mV
75
TP310 REC/PB 0.6 Vp-p
76
TP10 REC/PB 0.98 Vp

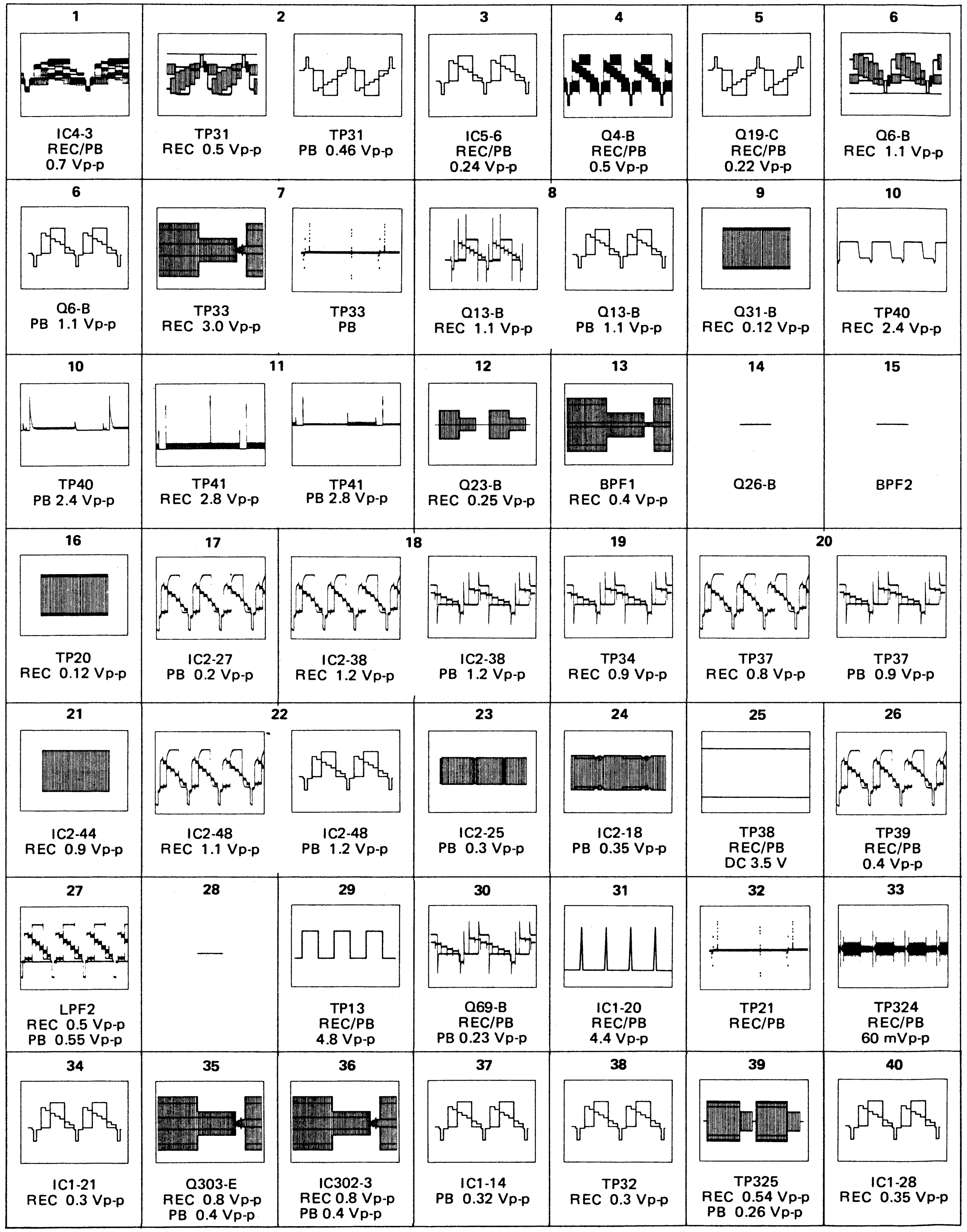

IC 14, IC 15, IC 16 LA7220
Q56 2SC1740S(S)
Q52, Q53 2SA933S(RS)
Q57 2SC1740S(QRS)
Q49, Q50, Q51 2SA854S(R)
TP GND 1
SWD 12V
IC 14
IC 16
IC15
IC 18
IC 17
IC 11
IC 12
TP110
TP310
TP 10
TP36 AGC
CN13 Y OUT GND C OUT GND
To 3 6 TERMINAL CN2
CN12 VIDEO OUT GND RF VIDEO OUT GND REMOTE PAUSE RF 12V
From/To 3 6 TERMINAL CN 5
CN3 BLUE BACK ON SCREEN TITLE REC PROG MODE VIDEO IN GND VIDEO OUT GND P MUTE SWD 5V
From/To 1 7 ON SCREEN CN102
CN4 Y OUT 1 GND C OUT 1 GND Y IN GND C IN GND Y OUT 2 GND C OUT 2 GND DIGITAL P IN P
From/To 1 5 DIGITAL CN 1
D FF INV SLOW PULSE SLOW PULSE
From/To 0 3 MAIN(SERVO)
CN3 SWD 5V GND SWD 12V
From 0 2 SWITCHING POWER SUPPLY(2), CN6
CN9 S MODE LED SWD 12V
From/To 3 2 LED CN104
CN8 EDIT TNR/SC/AUX VIDEO SEL SHARPNESS CTL SHARPNESS MAX
From/To 3 7 STEP CN5
CN11 GND VIDEO IN
From 3 6 TERMINAL CN 4
COMPOSITE VIDEO
AUX VIDEO
TUNER VIDEO
SWD 5V
R204 E-E LEVEL
Q66 DTA124ES
Q72 DTA124ES
IC 18 BU4013B
IC 11 AN3211NK
IC 12 BA7021
IC 17 LA7220
Q61 DTA124ES
Q58, Q59 2SA933S(RS)
Q60, Q62 DTC144ES

– Waveforms of VIDEO circuit –

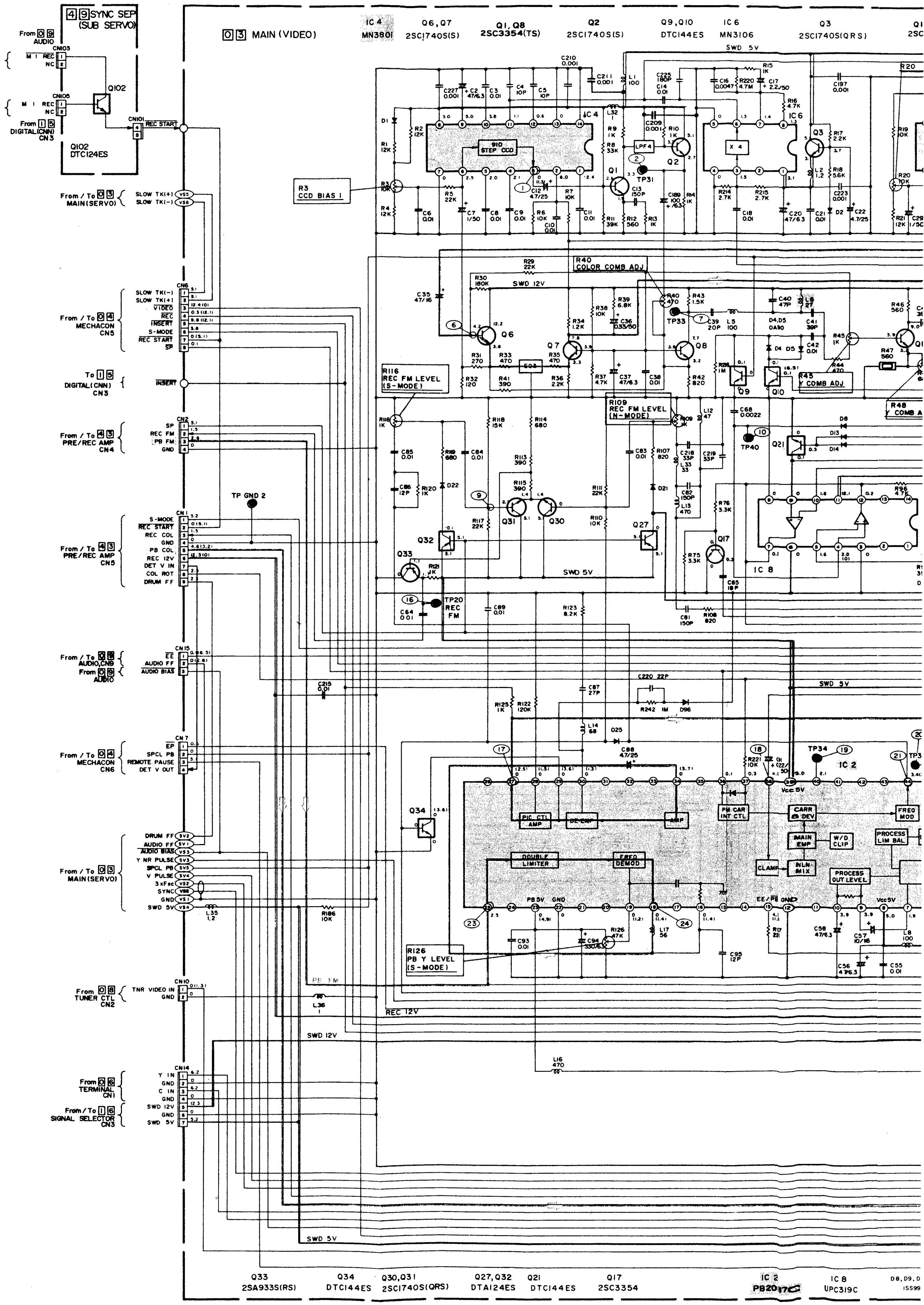


41	42	43	44	45	46	47
IC1-33 REC 1.2 Vp-p	IC1-10 REC 0.6 Vp-p	TP35 REC 0.6 Vp-p	TP309 REC/PB 0.5 Vp-p	IC1-40 DC 4.5 V	IC1-1 REC 1.0 Vp-p	IC301-8 REC 0.6 Vp-p PB 0.3 Vp-p
48	49	50	51		52	
IC301-9 REC 0.1 Vp-p PB 0.3 Vp-p	TP307 PB 50 mVp-p	TP12 REC/PB 4.8 Vp-p	IC301-17 REC 0.65 Vp-p	IC301-17 PB 0.5 Vp-p	TP30 REC 1.0 Vp-p	TP30 PB 1.0 Vp-p
53	54		55	56		57
TP6 PB 0.8 Vp-p	IC301-14 REC 1.2 Vp-p	IC301-14 PB 1.1 Vp-p	IC3-1 REC 0.62 Vp-p	IC3-32 REC 0.72 Vp-p	IC3-32 PB 0.4 Vp-p	— BPF301
58	59	60	61	62	63	64
IC3-26 PB 0.2 Vp-p	IC3-24 REC/PB 1.0 Vp-p	IC3-10 REC/PB 1.0 Vp-p	TP305 REC 20 mVp-p	IC3-19 REC 0.6 Vp-p PB 0.5 Vp-p	IC3-18 REC/PB 0.58 Vp-p	IC18-1 REC/PB 35 mVp-p
65		66	67		68	
IC11-16 REC 1.1 Vp-p	IC11-16 PB 20 mVp-p	TP36 REC 1.1 Vp-p	IC11-10 REC 2.2 Vp-p	IC11-10 PB 50 mVp-p	IC11-8 REC 0.7 Vp-p	IC11-8 PB 18 mVp-p
69		70	71	72	73	74
Q58-E REC 0.58 Vp-p	Q58-E PB 18 mVp-p	Q59-E REC 1.1 Vp-p	Q49-B REC 1.8 Vp-p PB 2.0 Vp-p	Q51-B REC/PB 1.24 Vp-p	Q50-B REC/PB 1.8 Vp-p	TP110 REC/PB 0.98 Vp-p
75	76					
TP310 REC/PB 0.6 Vp-p	TP10 REC/PB 0.98 Vp-p					

— Waveforms of VIDEO circuit —

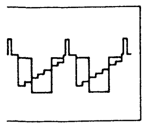


3.18 VIDEO (PB) SCHEMATIC DIAGRAM


49 SYNC SEP (SUB SERVO)
Q102 DTC124ES
REC START
03 MAIN (VIDEO)
IC4 MN3801
Q6,Q7 2SC1740S(S)
Q1,Q8 2SC3354(TS)
Q2 2SC1740S(S)
Q9,Q10 DTC144ES
IC6 MN3106
Q3 2SC1740S(QRS)
R3 CCD BIAS I
R40 COLOR COMB ADJ
R116 REC FM LEVEL (S-MODE)
R109 REC FM LEVEL (N-MODE)
R45 Y COMB ADJ
R48 Y COMB A
R126 PB Y LEVEL (S-MODE)
TP GND 2
TP31
TP33
TP40
TP20 REC FM
TP34
IC2
IC8
SWD 5V
SWD 12V
REC 12V
From/To 05 MAIN(SERVO)
From/To 04 MECHACON CN5
To 15 DIGITAL(CNN) CN3
From/To 45 PRE/REC AMP CN4
From/To 45 PRE/REC AMP CN5
From/To 06 AUDIO,CN6
From/To 04 MECHACON CN6
From/To 05 MAIN(SERVO)
From 08 TUNER CTL CN2
From 08 TERMINAL CN1
From/To 16 SIGNAL SELECTOR CN3
Q33 2SA933S(RS)
Q34 DTC144ES
Q30,Q31 2SC1740S(QRS)
Q27,Q32 DTA124ES
Q21 DTC144ES
Q17 2SC3354
IC2 PB2017C
IC8 UPC319C

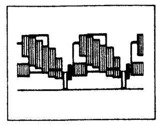
3.18 VIDEO (PB) SCHEMATIC DIAGRAM

5



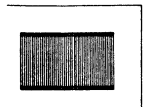
Q19-C
REC/PB
0.22 Vp-p

6



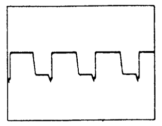
Q6-B
REC 1.1 Vp-p

9



Q31-B
EC 0.12 Vp-p

10



TP40
REC 2.4 Vp-p

14

—

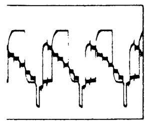
Q26-B

15

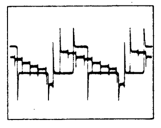
—

BPF2

20

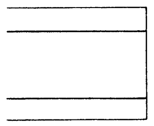


TP37
REC 0.8 Vp-p



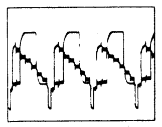
TP37
PB 0.9 Vp-p

25



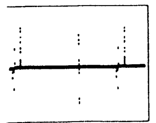
TP38
REC/PB
DC 3.5 V

26



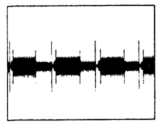
TP39
REC/PB
0.4 Vp-p

32



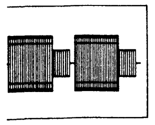
TP21
REC/PB

33



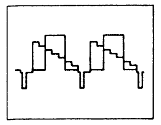
TP324
REC/PB
60 mVp-p

39

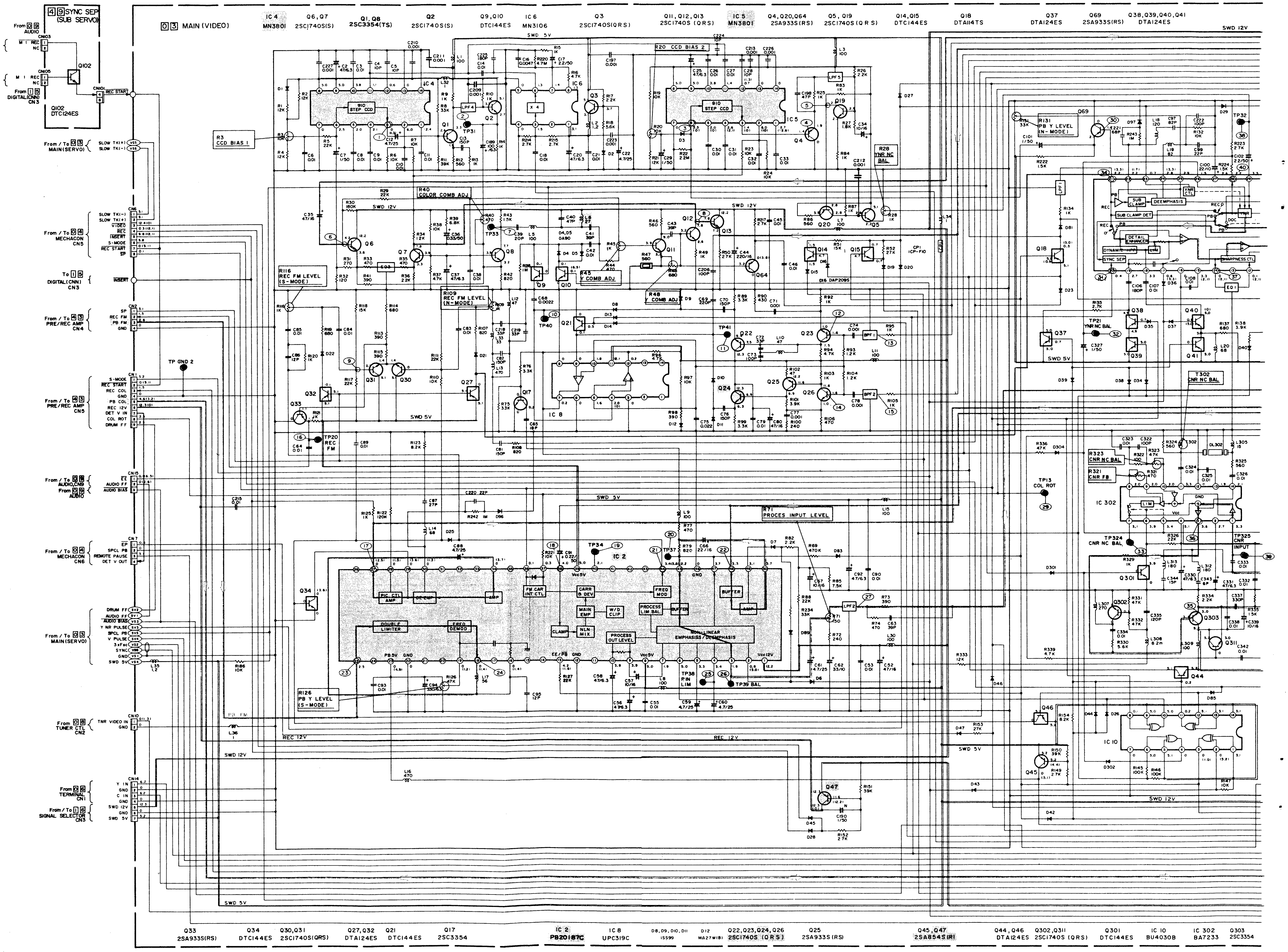


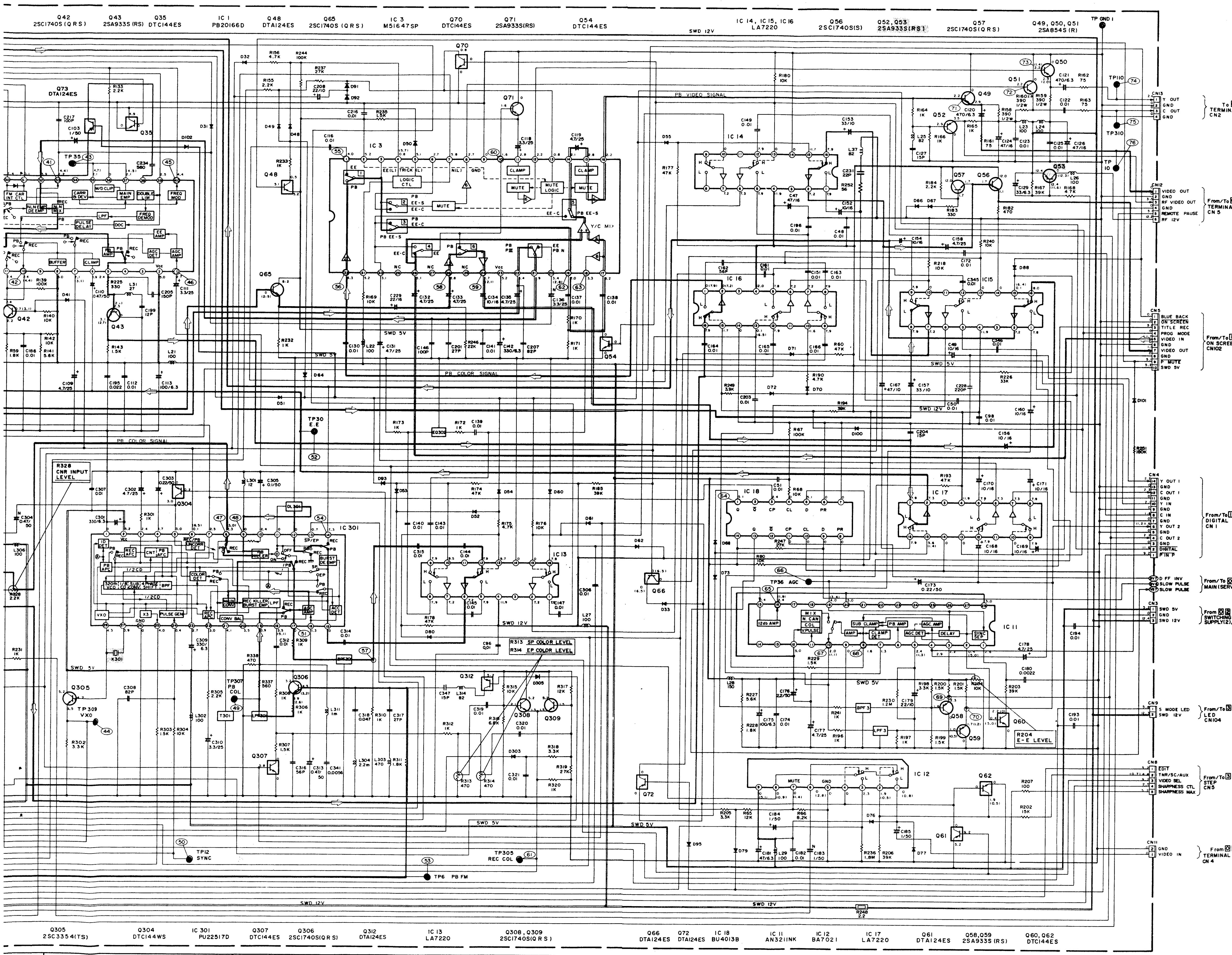
TP325
REC 0.54 Vp-p
PB 0.26 Vp-p

40

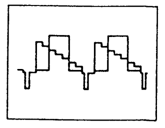


IC1-28
REC 0.35 Vp-p

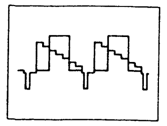

4 9 SYNC SEP (SUB SERVO)
0 3 MAIN (VIDEO)
IC4 MN3801
Q6,Q7 2SC1740S(S)
Q1,Q8 2SC3354(TS)
Q2 2SC1740S(S)
Q9,Q10 DTC144ES
IC6 MN3106
Q3 2SC1740S(QRS)
Q11,Q12,Q13 2SC1740S (QRS)
IC5 MN3801
Q4,Q20,Q64 2SA933S(RS)
Q5,Q19 2SC1740S(QRS)
Q14,Q15 DTC144ES
Q18 DTA114TS
Q37 DTA124ES
Q69 2SA933S(RS)
Q38,Q39,Q40,Q41 DTA124ES
SWD 12V
SWD 5V
Q102 DTC124ES
From 0 8 AUDIO
From 1 5 DIGITAL(CNN) CN3
From / To 0 5 MAIN(SERVO)
From / To 0 4 MECHACON CN5
To 1 5 DIGITAL(CNN) CN3
From / To 4 5 PRE/REC AMP CN4
From / To 4 5 PRE/REC AMP CN5
From / To 0 8 AUDIO CN9
From 0 8 AUDIO
From / To 0 4 MECHACON CN6
From / To 0 5 MAIN(SERVO)
From 0 8 TUNER CTL CN2
From 2 6 TERMINAL CN1
From / To 1 6 SIGNAL SELECTOR CN3
TP GND 2
R3 CCD BIAS I
R20 CCD BIAS 2
R40 COLOR COMB ADJ
R116 REC FM LEVEL (S-MODE)
R109 REC FM LEVEL (N-MODE)
R45 Y COMB ADJ
R48 Y COMB ADJ
R28 YNR NC BAL
R131 PB Y LEVEL (N-MODE)
R126 PB Y LEVEL (S-MODE)
R71 PROCES INPUT LEVEL
R323 CNR NC BAL
R321 CNR FB
T302 CNR NC BAL
TP21 YNR NC BAL
TP13 COL ROT
TP324 CNR NC BAL
TP325 CNR INPUT
TP20 REC FM
TP38 P/N LIM
TP39 BAL
IC 2
PIC CTL AMP
DE-EMP
AMP
DOUBLE LIMITER
FREQ DEMOD
FM CAR INT CTL
CARR B DEV
FREQ MOD
MAIN EMP
W/D CLIP
PROCESS LIM BAL
BUFFER
CLAMP
NLN MIX
PROCESS OUT LEVEL
NON-LINEAR EMPHASISS/DEEMPHASIS
IC 8
IC 302
IC 10
SUB CLAMP
DEEMPHASIS
SUB CLAMP DET
DETAIL ENHANCER
SHARPNESS CTL
SYNC SEP
REC 12V
Q33 2SA933S(RS)
Q34 DTC144ES
Q30,Q31 2SC1740S(QRS)
Q27,Q32 DTA124ES
Q21 DTC144ES
Q17 2SC3354
IC 2 PB2018 7C
IC 8 UPC319C
D8,D9,D10,D11 1S599
D12 MA27W(B)
Q22,Q23,Q24,Q26 2SC1740S (QRS)
Q25 2SA933S(RS)
Q45,Q47 2SA854S(R)
Q44,Q46 DTA124ES
Q302,Q311 2SC1740S (QRS)
Q301 DTC144ES
IC 10 BU4030B
IC 302 BA7233
Q303 2SC3354


Q42 2SC1740S (QRS)
Q43 2SA933S (RS)
Q35 DTC144ES
IC1 PB20166D
Q48 DTA124ES
Q65 2SC1740S (QRS)
IC3 M51647SP
Q70 DTC144ES
Q71 2SA933S(RS)
Q54 DTC144ES
IC14, IC15, IC16 LA7220
Q56 2SC1740S(S)
Q52, Q53 2SA933S(RS)
Q57 2SC1740S(QRS)
Q49, Q50, Q51 2SA854S (R)
TP GND 1
SWD 12V
PB VIDEO SIGNAL
PB COLOR SIGNAL
SWD 5V
TP30 E-E
R328 CNR INPUT LEVEL
TP36 AGC
R313 SP COLOR LEVEL
R314 EP COLOR LEVEL
R204 E-E LEVEL
TP309 VXO
TP307 PB COL
TP12 SYNC
TP305 REC COL
TP6 PB FM
TP35
TP110
TP310
TP10
CN13 Y OUT GND C OUT GND To 06 TERMINAL CN2
CN12 VIDEO OUT GND RF VIDEO OUT GND REMOTE PAUSE RF 12V From/To 06 TERMINAL CN5
CN5 BLUE BACK ON SCREEN TITLE REC PROG MODE VIDEO IN GND VIDEO OUT GND P MUTE SWD 5V From/To 17 ON SCREEN CN102
CN4 Y OUT 1 GND C OUT 1 GND Y IN GND C IN GND Y OUT 2 GND C OUT 2 GND DIGITAL P IN P From/To 18 DIGITAL CN1
D FF INV SLOW PULSE SLOW PULSE From/To 03 MAIN (SERVO)
CN3 SWD 5V GND SWD 12V From 02 SWITCHING POWER SUPPLY(2), CN6
CN9 S MODE LED SWD 12V From/To 32 LED CN104
CN8 EDIT TNR/SC/AUX VIDEO SEL SHARPNESS CTL STEP SHARPNESS MAX From/To 37 TERMINAL CN5
CN11 GND VIDEO IN From 06 TERMINAL CN4
IC 3
IC 14
IC 16
IC15
IC 18
IC 17
IC 13
IC 301
IC 11
IC 12
Q305 2SC3354(TS)
Q304 DTC144WS
IC 301 PU22517D
Q307 DTC144ES
Q306 2SC1740S(QRS)
Q312 DTA124ES
IC 13 LA7220
Q308, Q309 2SC1740S(QRS)
Q66 DTA124ES
Q72 DTA124ES
IC 18 BU4013B
IC 11 AN3211NK
IC 12 BA7021
IC 17 LA7220
Q61 DTA124ES
Q58, Q59 2SA933S (RS)
Q60, Q62 DTC144ES

41	42

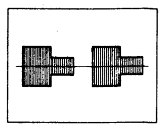


IC1-33
REC 1.2 Vp-p



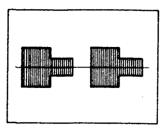
IC1-10
REC 0.6 Vp-p

48



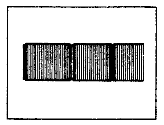
IC301-9
REC 0.1 Vp-p
PB 0.3 Vp-p

49



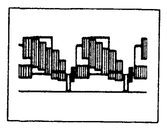
TP307
PB 50 mVp-p

53



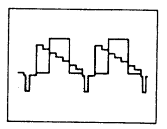
TP6
PB 0.8 Vp-p

54



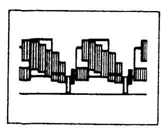
IC301-14
REC 1.2 Vp-p

58



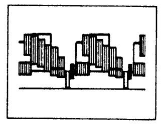
IC3-26
PB 0.2 Vp-p

59

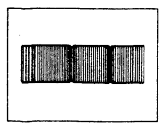


IC3-24
REC/PB
1.0 Vp-p

65

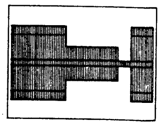


IC11-16
REC 1.1 Vp-p

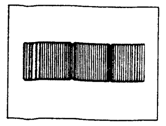


IC11-16
PB 20 mVp-p

69

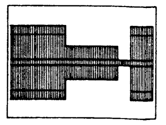


Q58-E
REC 0.58 Vp-p



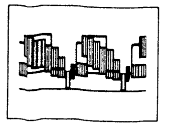
Q58-E
PB 18 mVp-p

75

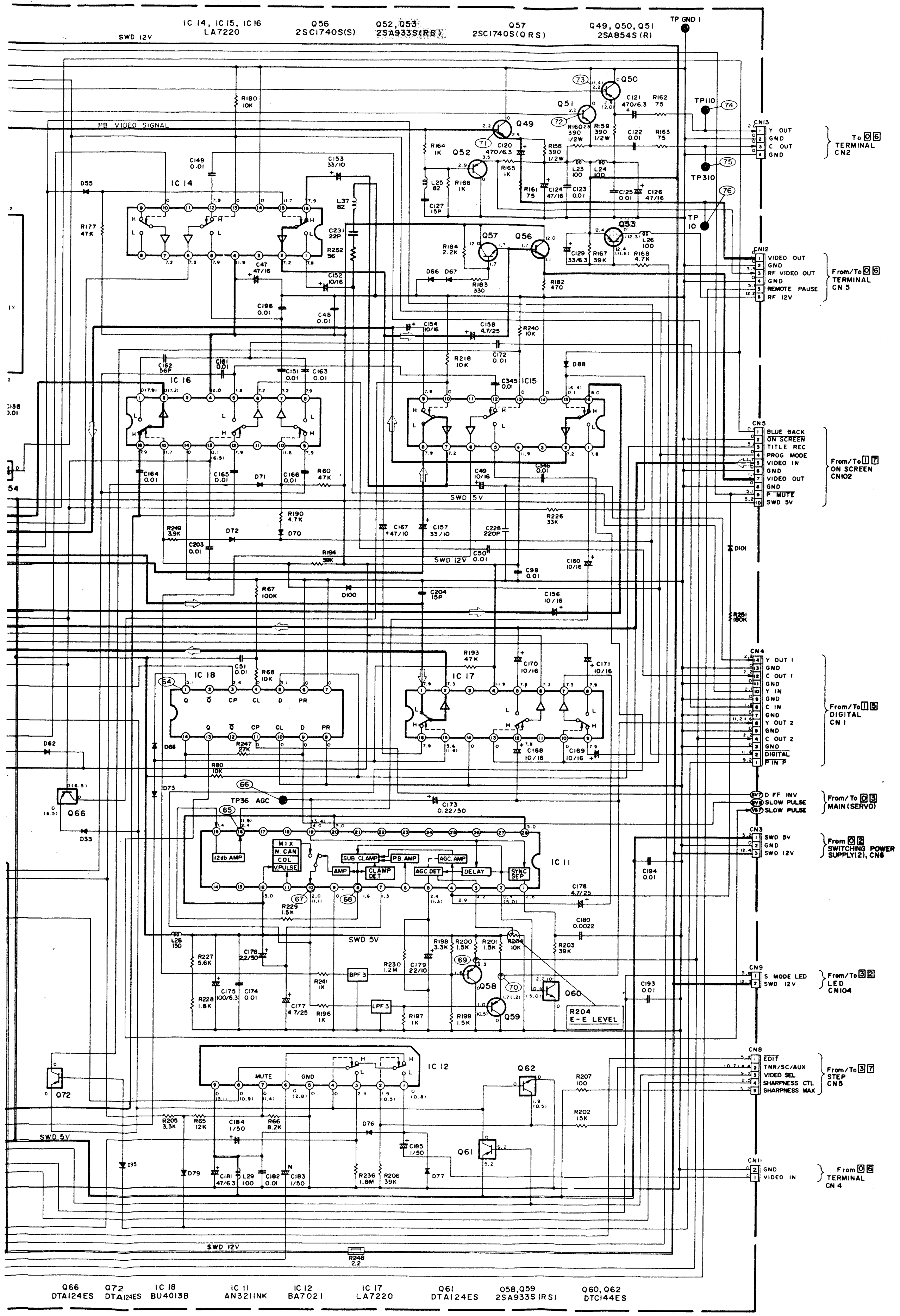


TP310
REC/PB
0.6 Vp-p

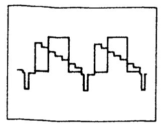
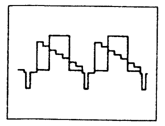
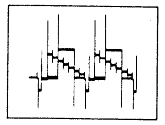
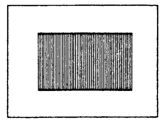
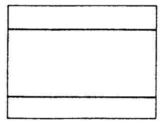
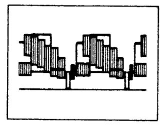
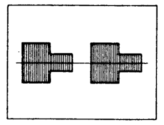
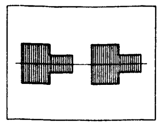
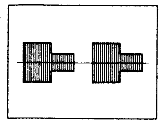
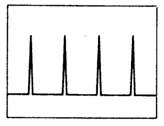
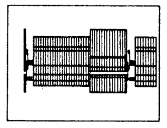
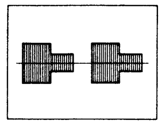
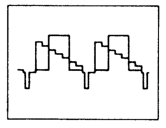
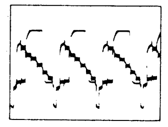
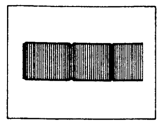
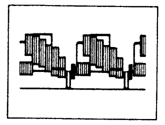
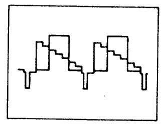
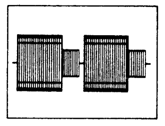
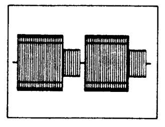
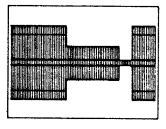
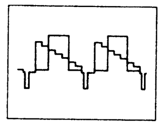
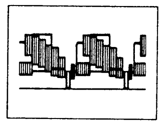
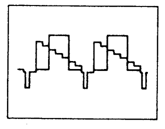
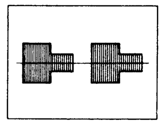
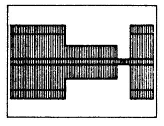
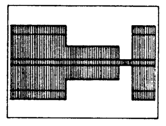
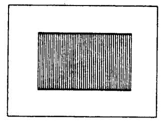
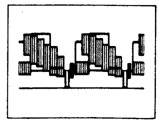
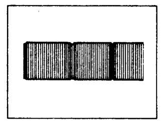
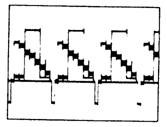
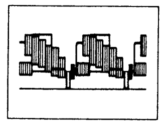
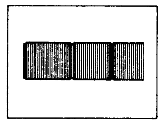
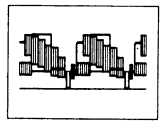
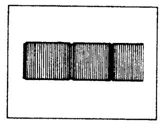
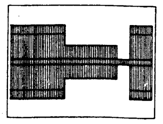
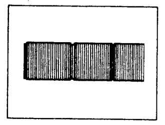
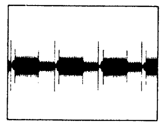
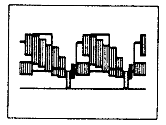
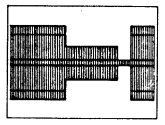
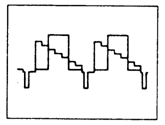
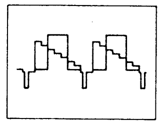
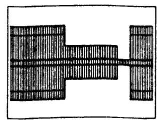
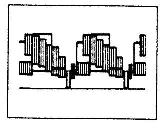
76



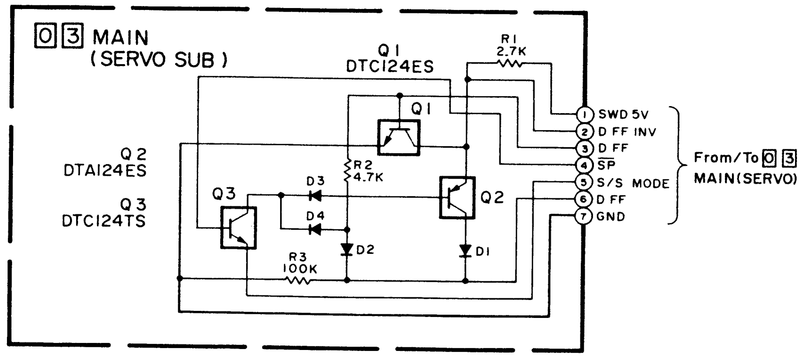
TP10
REC/PB
0.98 Vp-p


IC14, IC15, IC16 LA7220
Q56 2SC1740S(S)
Q52, Q53 2SA933S(RS)
Q57 2SC1740S(QRS)
Q49, Q50, Q51 2SA854S(R)
TP GND 1
SWD 12V
PB VIDEO SIGNAL
TP110
TP310
TP10
CN13
Y OUT
GND
C OUT
GND
To B6 TERMINAL CN2
CN12
VIDEO OUT
GND
RF VIDEO OUT
GND
REMOTE PAUSE
RF 12V
From/To B8 TERMINAL CN5
CN5
BLUE BACK
ON SCREEN
TITLE REC
PROG MODE
VIDEO IN
GND
VIDEO OUT
GND
P MUTE
SWD 5V
From/To 17 ON SCREEN CN102
CN4
Y OUT 1
GND
C OUT 1
GND
Y IN
GND
C IN
GND
Y OUT 2
GND
C OUT 2
GND
DIGITAL
P IN P
From/To 15 DIGITAL CN1
D FF INV
SLOW PULSE
SLOW PULSE
From/To 03 MAIN (SERVO)
CN3
SWD 5V
GND
SWD 12V
From 02 SWITCHING POWER SUPPLY(2), CN6
CN9
S MODE LED
SWD 12V
From/To 32 LED CN104
CN8
EDIT
TNR/SC/AUX
VIDEO SEL
SHARPNESS CTL
SHARPNESS MAX
From/To 37 STEP CN5
CN11
GND
VIDEO IN
From 06 TERMINAL CN4
IC14
IC16
IC15
IC18
IC17
IC11
IC12
TP36 AGC
12db AMP
MIX
N.CAN
COL
V.PULSE
AMP
CL AMP DET
SUB CLAMP
PB AMP
AGC DET
AGC AMP
DELAY
SYNC SEP
BPF3
LPF3
R204 E-E LEVEL
MUTE
GND
SWD 5V
SWD 12V
Q49
Q50
Q51
Q52
Q53
Q56
Q57
Q58
Q59
Q60
Q61
Q62
Q66
Q72
Q66 DTA124ES
Q72 DTA124ES
IC18 BU4013B
IC11 AN3211NK
IC12 BA7021
IC17 LA7220
Q61 DTA124ES
Q58, Q59 2SA933S(RS)
Q60, Q62 DTC144ES

– Waveforms of VIDEO circuit –

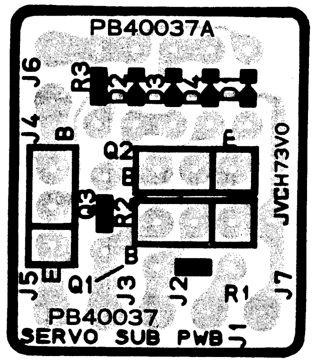
41	42	43	44	45	46	47
 IC1-33 REC 1.2 Vp-p	 IC1-10 REC 0.6 Vp-p	 TP35 REC 0.6 Vp-p	 TP309 REC/PB 0.5 Vp-p	 IC1-40 DC 4.5 V	 IC1-1 REC 1.0 Vp-p	 IC301-8 REC 0.6 Vp-p PB 0.3 Vp-p
48	**49**	**50**	**51**		**52**	
 IC301-9 REC 0.1 Vp-p PB 0.3 Vp-p	 TP307 PB 50 mVp-p	 TP12 REC/PB 4.8 Vp-p	 IC301-17 REC 0.65 Vp-p	 IC301-17 PB 0.5 Vp-p	 TP30 REC 1.0 Vp-p	 TP30 PB 1.0 Vp-p
53	**54**		**55**	**56**		**57**
 TP6 PB 0.8 Vp-p	 IC301-14 REC 1.2 Vp-p	 IC301-14 PB 1.1 Vp-p	 IC3-1 REC 0.62 Vp-p	 IC3-32 REC 0.72 Vp-p	 IC3-32 PB 0.4 Vp-p	— BPF301
58	**59**	**60**	**61**	**62**	**63**	**64**
 IC3-26 PB 0.2 Vp-p	 IC3-24 REC/PB 1.0 Vp-p	 IC3-10 REC/PB 1.0 Vp-p	 TP305 REC 20 mVp-p	 IC3-19 REC 0.6 Vp-p PB 0.5 Vp-p	 IC3-18 REC/PB 0.58 Vp-p	 IC18-1 REC/PB 35 mVp-p
65		**66**	**67**		**68**	
 IC11-16 REC 1.1 Vp-p	 IC11-16 PB 20 mVp-p	 TP36 REC 1.1 Vp-p	 IC11-10 REC 2.2 Vp-p	 IC11-10 PB 50 mVp-p	 IC11-8 REC 0.7 Vp-p	 IC11-8 PB 18 mVp-p
69		**70**	**71**	**72**	**73**	**74**
 Q58-E REC 0.58 Vp-p	 Q58-E PB 18 mVp-p	 Q59-E REC 1.1 Vp-p	 Q49-B REC 1.8 Vp-p PB 2.0 Vp-p	 Q51-B REC/PB 1.24 Vp-p	 Q50-B REC/PB 1.8 Vp-p	 TP110 REC/PB 0.98 Vp-p
75	**76**					
 TP310 REC/PB 0.6 Vp-p	 TP10 REC/PB 0.98 Vp-p					

3.19 SERVO, SERVO SUB SCHEMATIC DIAGRAMS AND SERVO SUB CIRCUIT BOARD

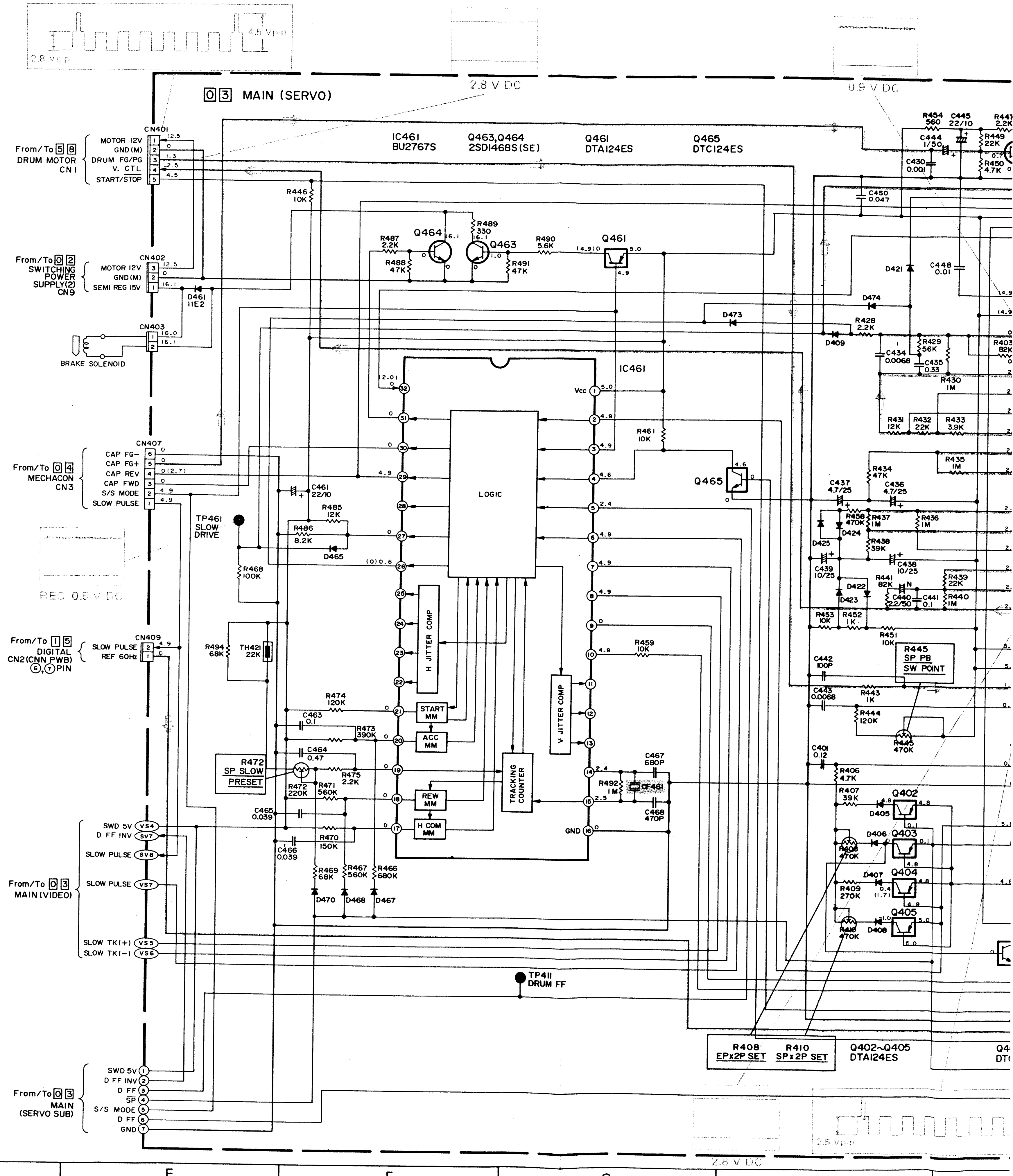


03 MAIN (SERVO SUB)
Q2 DTA124ES
Q3 DTC124TS
Q1 DTC124ES
R1 2.7K
R2 4.7K
R3 100K
D1
D2
D3
D4
1 SWD 5V
2 D FF INV
3 D FF
4 SP
5 S/S MODE
6 D FF
7 GND
From/To 03 MAIN(SERVO)

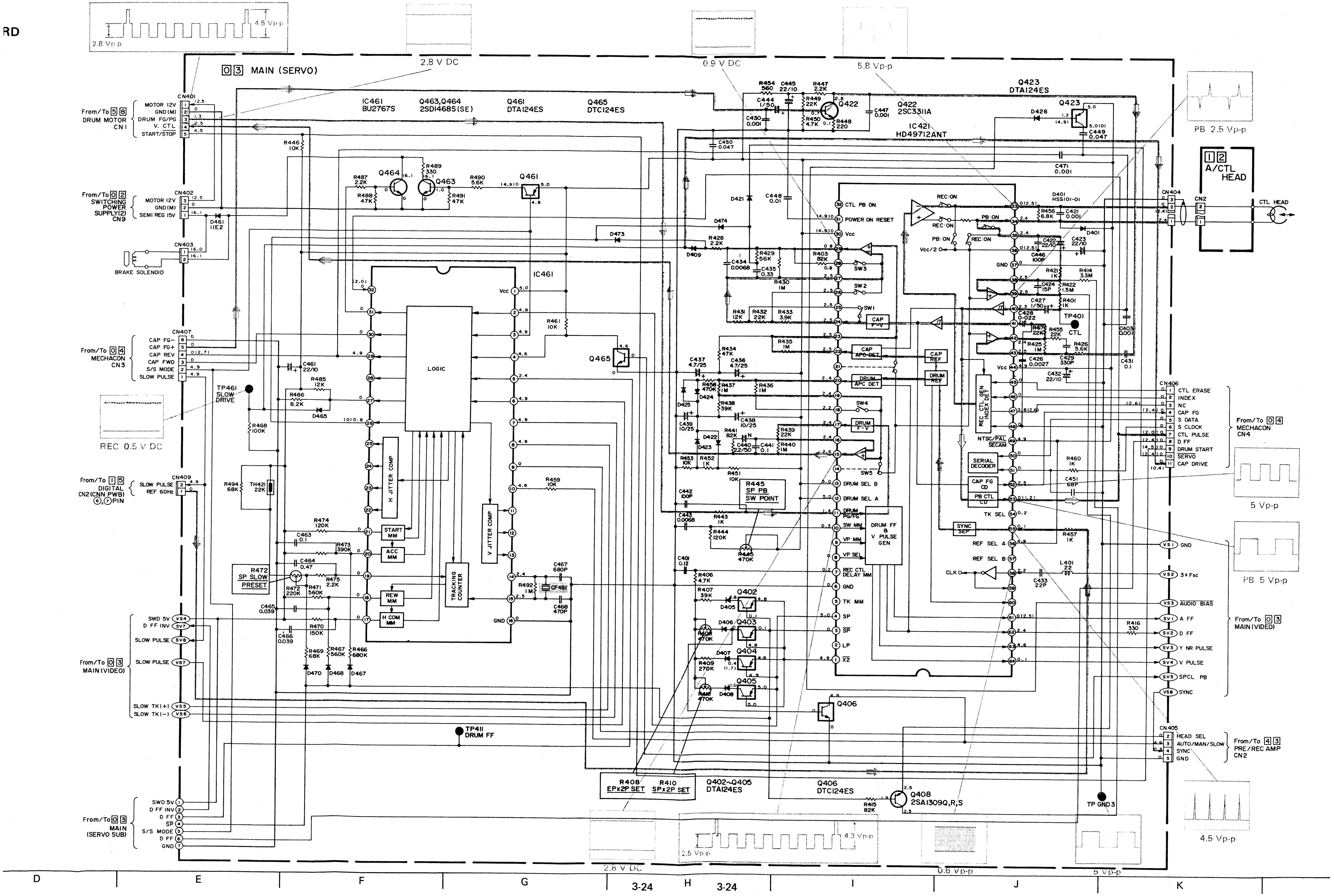
— SERVO SUB —



PB40037A
PB40037
SERVO SUB PWB
JVCH73V0
J1
J2
J3
J4
J5
J6
J7
Q1
Q2
Q3
R1
R2
R3
D1
D2
D3
D4

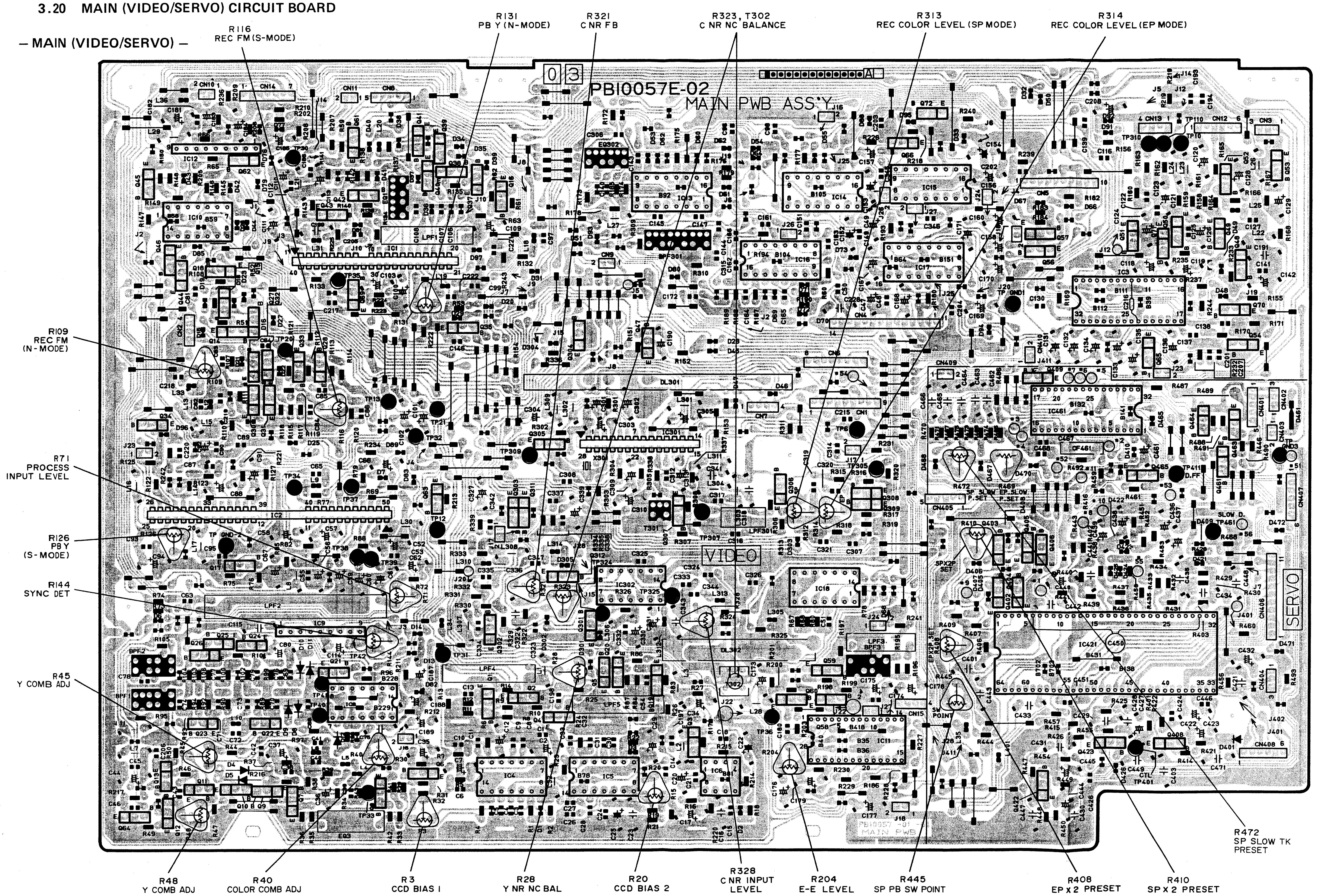


03 MAIN (SERVO)
2.8 Vp-p
4.5 Vp-p
2.8 V DC
0.9 V DC
REC 0.5 V DC
2.5 Vp-p
From/To 58 DRUM MOTOR CN1
MOTOR 12V
GND (M)
DRUM FG/PG
V. CTL
START/STOP
CN401
From/To 02 SWITCHING POWER SUPPLY(2) CN9
CN402
SEMI REG 15V
CN403
BRAKE SOLENOID
From/To 04 MECHACON CN3
CN407
CAP FG−
CAP FG+
CAP REV
CAP FWD
S/S MODE
SLOW PULSE
From/To 15 DIGITAL CN2(CNN PWB) 6,7 PIN
CN409
REF 60Hz
From/To 03 MAIN (VIDEO)
SWD 5V
D FF INV
SLOW TK(+)
SLOW TK(−)
From/To 03 MAIN (SERVO SUB)
D FF
SP
GND
IC461 BU2767S
Q463,Q464 2SD1468S(SE)
Q461 DTA124ES
Q465 DTC124ES
IC461
LOGIC
H JITTER COMP
V JITTER COMP
START MM
ACC MM
REW MM
H COM MM
TRACKING COUNTER
Vcc
GND
TP461 SLOW DRIVE
TP411 DRUM FF
R472 SP SLOW PRESET
R445 SP PB SW POINT
R408 EPx2P SET
R410 SPx2P SET
Q402~Q405 DTA124ES
D461 11E2

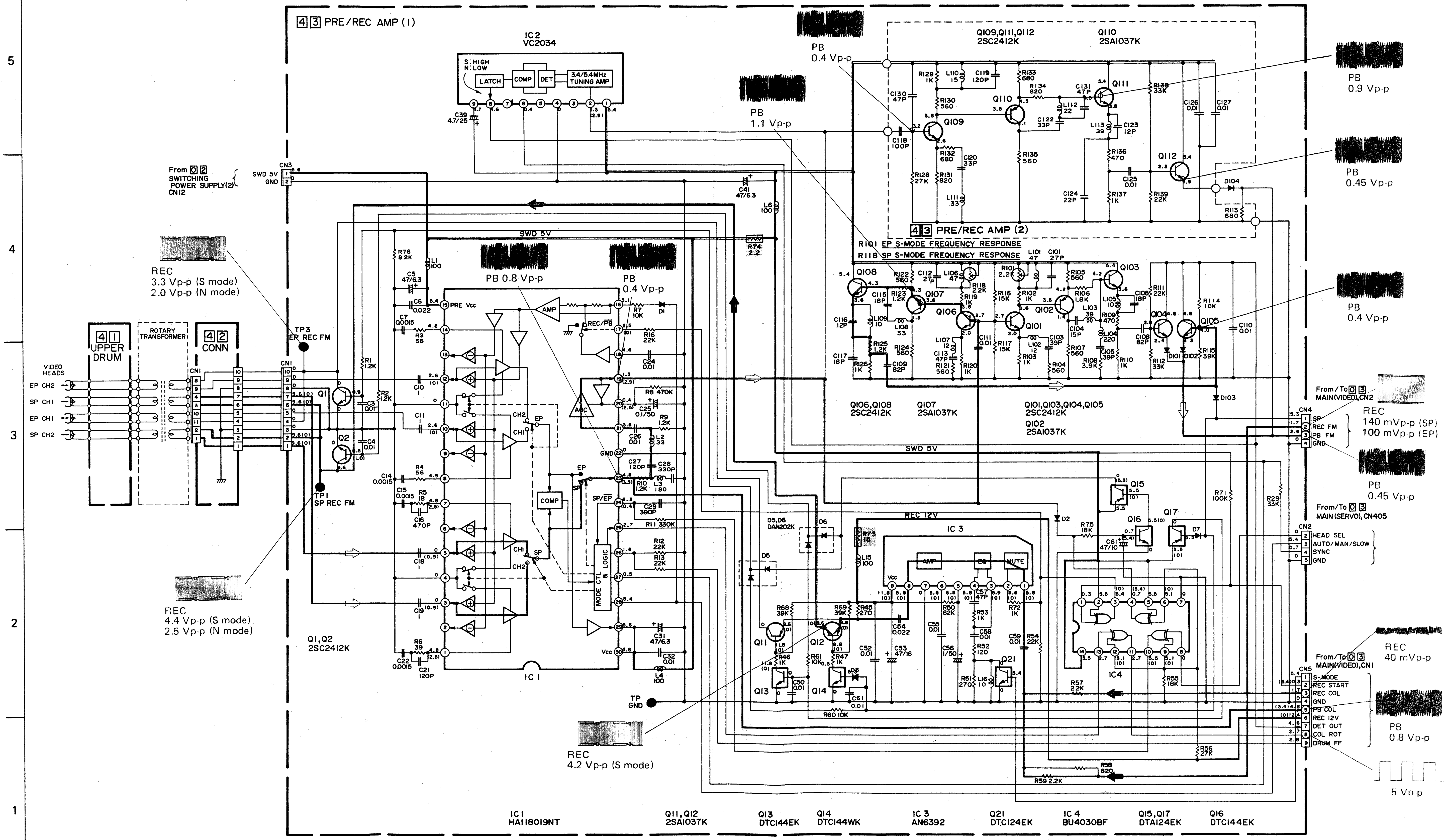

03 MAIN (SERVO)
2.8 Vp-p
4.5 Vp-p
2.8 V DC
0.9 V DC
5.8 Vp-p
PB 2.5 Vp-p
12 A/CTL HEAD
CTL HEAD
CN2
CN404
From/To 58 DRUM MOTOR CN1
CN401
MOTOR 12V
GND(M)
DRUM FG/PG
V. CTL
START/STOP
From/To 02 SWITCHING POWER SUPPLY(2) CN9
CN402
MOTOR 12V
GND(M)
SEMI REG 15V
D461 11E2
CN403
BRAKE SOLENOID
From/To 04 MECHACON CN3
CN407
CAP FG−
CAP FG+
CAP REV
CAP FWD
S/S MODE
SLOW PULSE
TP461 SLOW DRIVE
REC 0.5 V DC
From/To 15 DIGITAL CN2(CNN PWB) 6,7 PIN
CN409
SLOW PULSE
REF 60Hz
From/To 03 MAIN(VIDEO)
SWD 5V
D FF INV
SLOW PULSE
SLOW TK(+)
SLOW TK(−)
From/To 03 MAIN (SERVO SUB)
SWD 5V
D FF INV
D FF
SP
S/S MODE
D FF
GND
IC461 BU2767S
Q463,Q464 2SD1468S(SE)
Q461 DTA124ES
Q465 DTC124ES
Q464
Q463
Q461
Q465
IC461
LOGIC
H JITTER COMP
V JITTER COMP
START MM
ACC MM
REW MM
H COM MM
TRACKING COUNTER
CF461
R472 SP SLOW PRESET
TH421 22K
TP411 DRUM FF
Q422 2SC3311A
Q423 DTA124ES
IC421 HD49712ANT
CTL PB ON
POWER ON RESET
Vcc
GND
REC·ON
PB·ON
Vcc/2
SW1
SW2
SW3
SW4
SW5
CAP F−V
CAP APC DET
DRUM APC DET
CAP REF
DRUM REF
DRUM F−V
DRUM SEL B
DRUM SEL A
DRUM PG/FG
SW MM
VP MM
VP SEL
REC CTL DELAY MM
TK MM
SP
LP
X2
DRUM FF & V PULSE GEN
REC CTL GEN INDEX DET
NTSC/PAL SECAM
SERIAL DECODER
CAP FG CD
PB CTL CD
SYNC SEP
TK SEL
REF SEL A
REF SEL B
CLK
R445 SP PB SW POINT
TP401 CTL
D401 HSS101-01
Q402
Q403
Q404
Q405
Q406
Q408 2SA1309Q,R,S
R408 EPx2P SET
R410 SPx2P SET
Q402~Q405 DTA124ES
Q406 DTC124ES
TP GND3
From/To 04 MECHACON CN4
CN406
CTL ERASE
INDEX
NC
CAP FG
S DATA
S CLOCK
CTL PULSE
D FF
DRUM START
SERVO
CAP DRIVE
5 Vp-p
PB 5 Vp-p
From/To 03 MAIN(VIDEO)
GND
3×Fsc
AUDIO BIAS
A FF
D FF
Y NR PULSE
V PULSE
SPCL PB
SYNC
From/To 43 PRE/REC AMP CN2
CN405
HEAD SEL
AUTO/MAN/SLOW
SYNC
GND
4.5 Vp-p
2.5 Vp-p
4.3 Vp-p
2.8 V DC
0.6 Vp-p
5 Vp-p
D
E
F
G
H
I
J
K

3.20 MAIN (VIDEO/SERVO) CIRCUIT BOARD

– MAIN (VIDEO/SERVO) –


R116
REC FM (S-MODE)
R131
PB Y (N-MODE)
R321
C NR FB
R323, T302
C NR NC BALANCE
R313
REC COLOR LEVEL (SP MODE)
R314
REC COLOR LEVEL (EP MODE)
PB10057E-02
MAIN PWB ASS'Y
VIDEO
SERVO
R109
REC FM
(N-MODE)
R71
PROCESS
INPUT LEVEL
R126
PB Y
(S-MODE)
R144
SYNC DET
R45
Y COMB ADJ
R472
SP SLOW TK
PRESET
R48
Y COMB ADJ
R40
COLOR COMB ADJ
R3
CCD BIAS 1
R28
Y NR NC BAL
R20
CCD BIAS 2
R328
C NR INPUT
LEVEL
R204
E-E LEVEL
R445
SP PB SW POINT
R408
EP x 2 PRESET
R410
SP x 2 PRESET
1
2
3
4
5
6
A
B
C
E
F
G
H

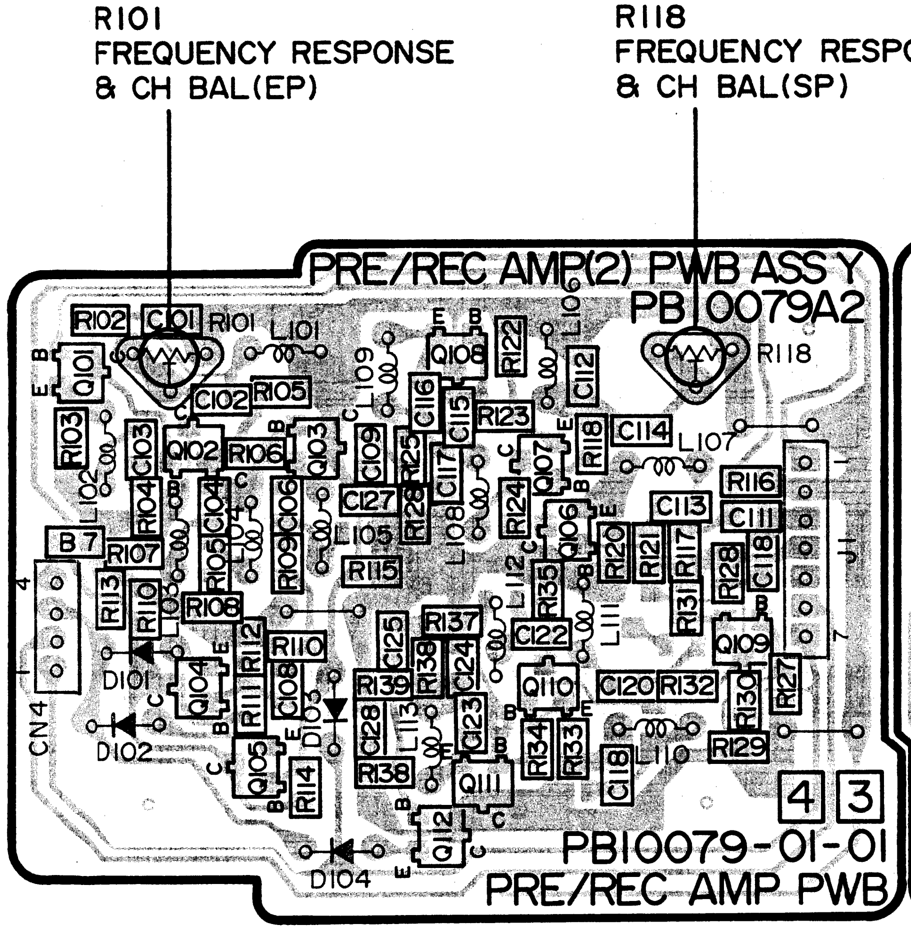
3.21 PRE/REC AMP SCHEMATIC DIAGRAM



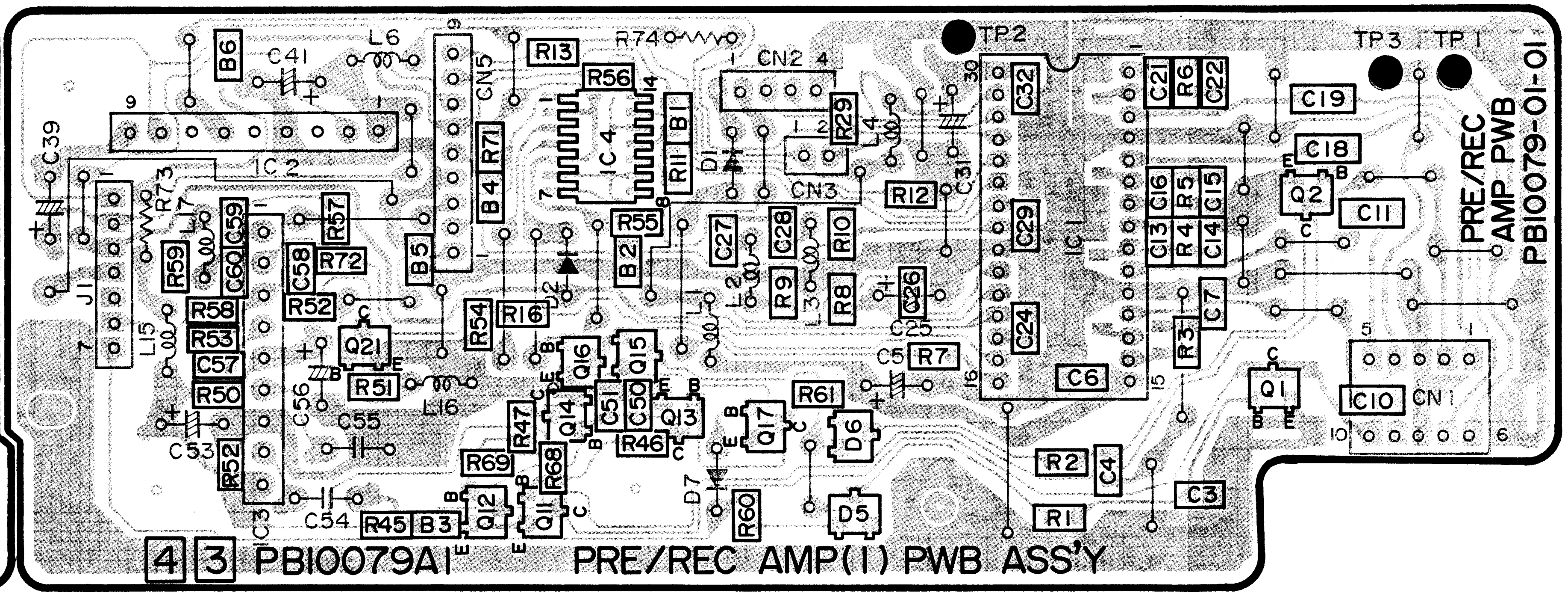
43 PRE/REC AMP (1)
43 PRE/REC AMP (2)
IC2 VC2034
S: HIGH N: LOW
LATCH
COMP
DET
3.4/5.4MHz TUNING AMP
Q109,Q111,Q112 2SC2412K
Q110 2SA1037K
PB 0.4 Vp-p
PB 1.1 Vp-p
PB 0.9 Vp-p
PB 0.45 Vp-p
PB 0.4 Vp-p
PB 0.8 Vp-p
PB 0.45 Vp-p
From 02 SWITCHING POWER SUPPLY(2) CN12
SWD 5V
GND
CN3
SWD 5V
REC 3.3 Vp-p (S mode) 2.0 Vp-p (N mode)
TP3 EP REC FM
TP1 SP REC FM
REC 4.4 Vp-p (S mode) 2.5 Vp-p (N mode)
REC 4.2 Vp-p (S mode)
TP GND
VIDEO HEADS
EP CH2
SP CH1
EP CH1
SP CH2
41 UPPER DRUM
ROTARY TRANSFORMER
42 CONN
CN1
Q1
Q2
Q1,Q2 2SC2412K
PRE Vcc
AMP
REC/PB
AGC
COMP
MODE CTL LOGIC
CH1
CH2
EP
SP
SP/EP
IC1
R101 EP S-MODE FREQUENCY RESPONSE
R118 SP S-MODE FREQUENCY RESPONSE
Q106,Q108 2SC2412K
Q107 2SA1037K
Q101,Q103,Q104,Q105 2SC2412K
Q102 2SA1037K
D101
D102
D103
D104
REC 12V
IC3
AMP
EQ
MUTE
Vcc
D5,D6 DAN202K
IC4
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q21
D2
D7
From/To 03 MAIN(VIDEO),CN2
CN4
SP
REC FM
PB FM
GND
REC 140 mVp-p (SP) 100 mVp-p (EP)
From/To 03 MAIN(SERVO),CN405
CN2
HEAD SEL
AUTO/MAN/SLOW
SYNC
GND
From/To 03 MAIN(VIDEO),CN1
CN5
S-MODE
REC START
REC COL
GND
PB COL
REC 12V
DET OUT
COL ROT
DRUM FF
REC 40 mVp-p
PB 0.8 Vp-p
5 Vp-p
IC1 HA118019NT
Q11,Q12 2SA1037K
Q13 DTC144EK
Q14 DTC144WK
IC3 AN6392
Q21 DTC124EK
IC4 BU4030BF
Q15,Q17 DTA124EK
Q16 DTC144EK

3.22 PRE/REC AMP (1) AND PRE/REC AMP (2) CIRCUIT BOARDS

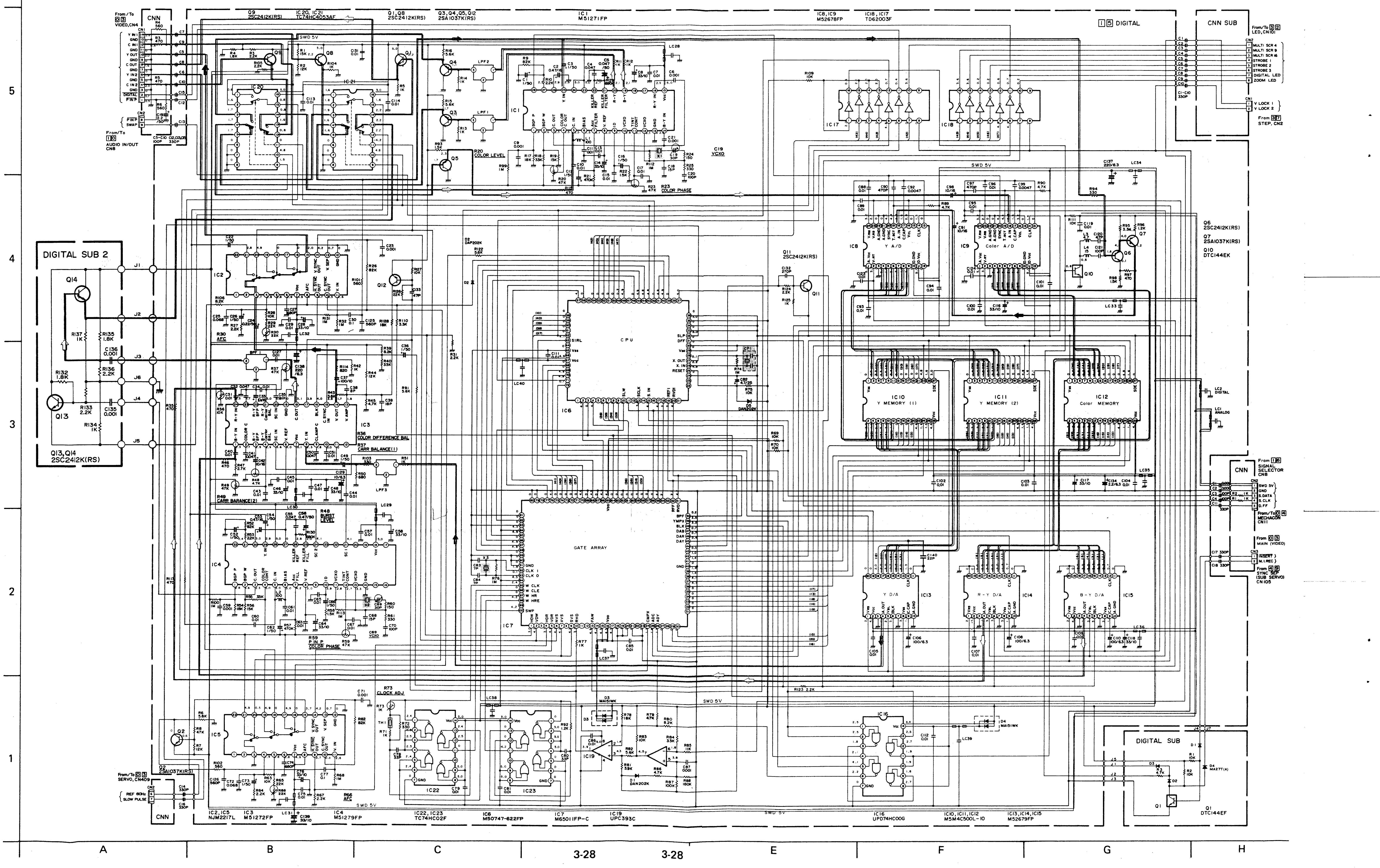
– PRE/REC AMP (2) –


R101
FREQUENCY RESPONSE
& CH BAL(EP)
R118
FREQUENCY RESPONSE
& CH BAL(SP)
PRE/REC AMP(2) PWB ASS'Y
PB10079A2
4 3
PB10079-01-01
PRE/REC AMP PWB

– PRE/REC AMP (1) –


TP2
TP3
TP1
PRE/REC
AMP PWB
PB10079-01-01
4 3 PB10079A1
PRE/REC AMP(1) PWB ASS'Y

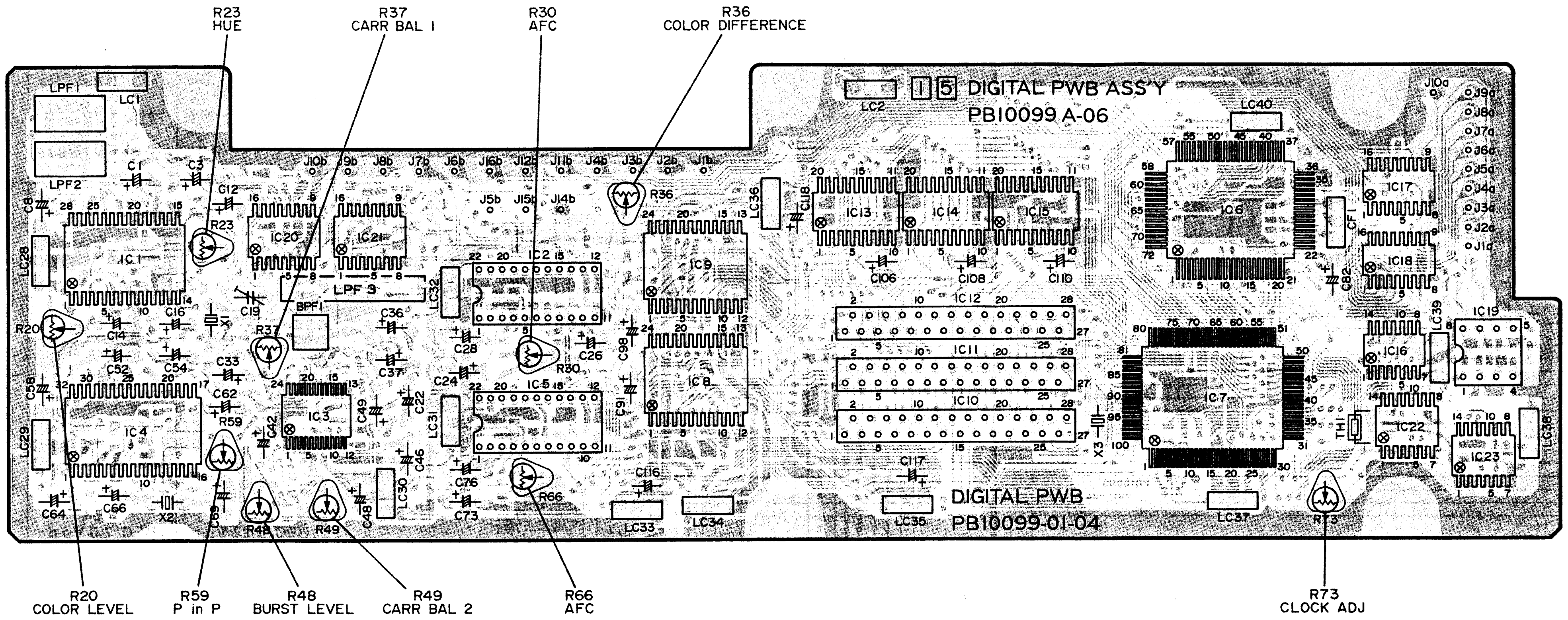
3.23 DIGITAL, DIGITAL SUB, DIGITAL SUB 2, CNN AND CNN SUB SCHEMATIC DIAGRAMS



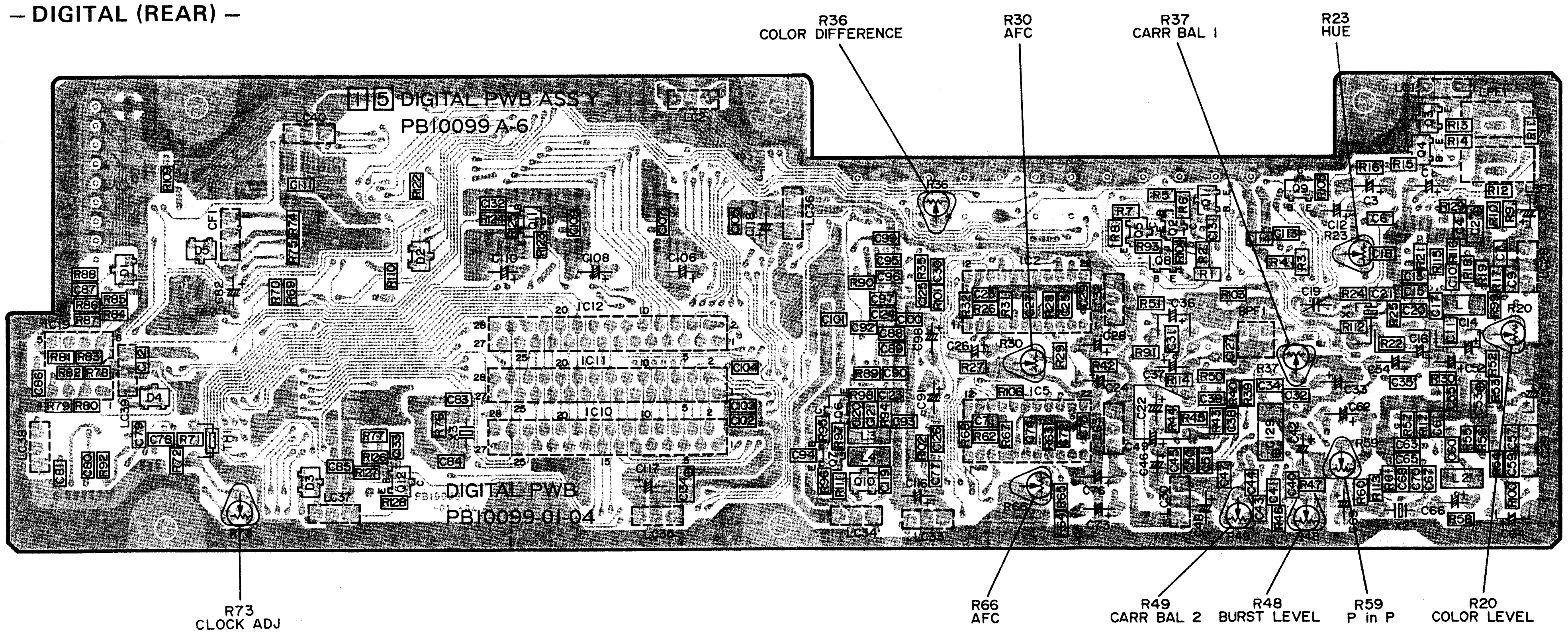
CNN
CNN SUB
DIGITAL SUB 2
DIGITAL SUB
1 5 DIGITAL
Q9 2SC2412K(RS)
IC20, IC21 TC74HC4053AF
Q1, Q8 2SC2412K(RS)
Q3, Q4, Q5, Q12 2SA1037K(RS)
IC1 M51271FP
IC8, IC9 M52678FP
IC18, IC17 TD62003F
Q13, Q14 2SC2412K(RS)
Q6 2SC2412K(RS)
Q7 2SA1037K(RS)
Q10 DTC144EK
Q11 2SC2412K(RS)
Q2 2SA1037K(RS)
Q1 DTC144EF
CPU
GATE ARRAY
IC10 Y MEMORY (1)
IC11 Y MEMORY (2)
IC12 Color MEMORY
IC13 Y D/A
IC14 R-Y D/A
IC15 B-Y D/A
IC8 Y A/D
IC9 Color A/D
R20 COLOR LEVEL
R23 COLOR PHASE
C19 VCXO
R30 AFC
R36 COLOR DIFFERENCE BAL
R37 CARR BALANCE (1)
R49 CARR BARANCE (2)
R48 BURST LEVEL
R59 P IN P COLOR PHASE
R73 CLOCK ADJ
SWD 5V
IC2, IC5 NJM2217L
IC3 M51272FP
IC4 M51279FP
IC22, IC23 TC74HC02F
IC6 M50747-622FP
IC7 M65011FP-C
IC19 UPC393C
IC16 UPD74HC00G
IC10, IC11, IC12 M5M4C500L-10
IC13, IC14, IC15 M52679FP
A
B
C
D
E
F
G
H
1
2
3
4
5
6

3.24 DIGITAL, DIGITAL SUB, DIGITAL SUB 2, CNN AND CNN SUB CIRCUIT BOARDS

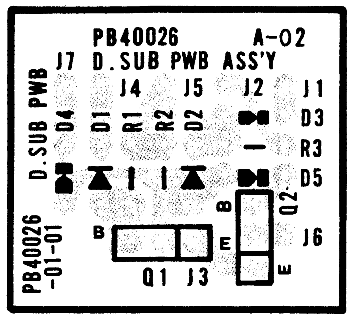
– DIGITAL (FRONT) –


R23
HUE
R37
CARR BAL I
R30
AFC
R36
COLOR DIFFERENCE
1 5 DIGITAL PWB ASS'Y
PB10099 A-06
DIGITAL PWB
PB10099-01-04
R20
COLOR LEVEL
R59
P in P
R48
BURST LEVEL
R49
CARR BAL 2
R66
AFC
R73
CLOCK ADJ

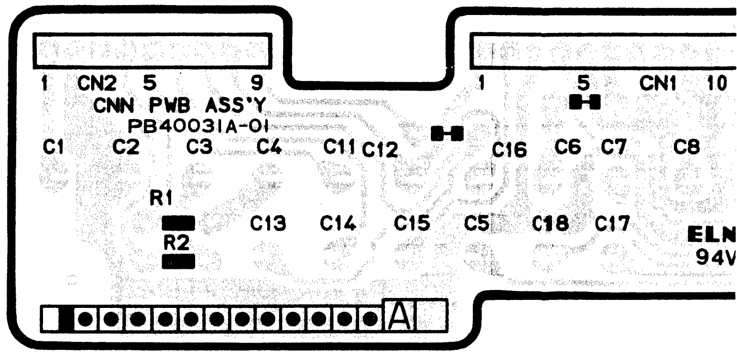
– DIGITAL (REAR) –


R36
COLOR DIFFERENCE
R30
AFC
R37
CARR BAL I
R23
HUE
1 5 DIGITAL PWB ASS'Y
PB10099 A-6
DIGITAL PWB
PB10099-01-04
R73
CLOCK ADJ
R66
AFC
R49
CARR BAL 2
R48
BURST LEVEL
R59
P in P
R20
COLOR LEVEL

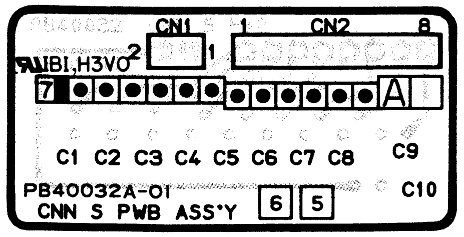
– DIGITAL SUB –

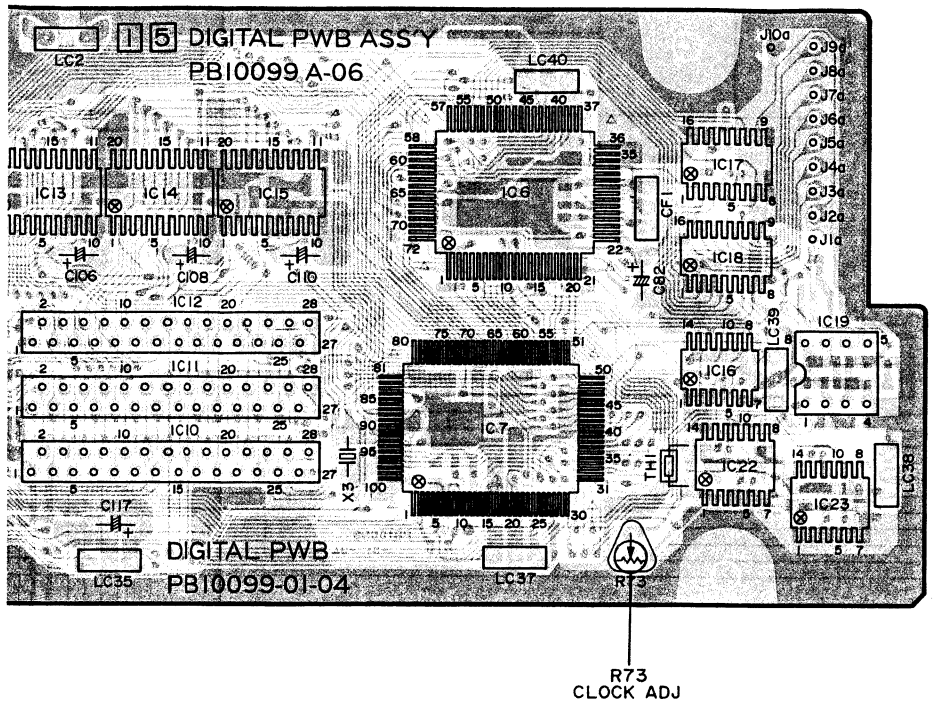

PB40026 A-02
J7 D.SUB PWB ASS'Y
D.SUB PWB
PB40026-01-01
J4 J5 J2 J1
D4 D1 R1 R2 D2
D3
R3
D5
Q2
J6
B E
Q1 J3

– CNN –

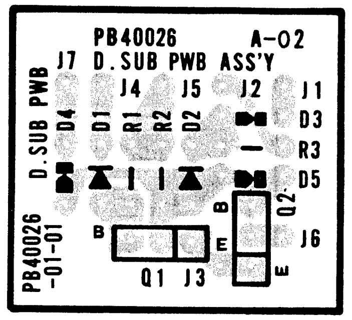

1 CN2 5 9
CNN PWB ASS'Y
PB40031A-01
1 5 CN1 10
C1 C2 C3 C4 C11 C12 C16 C6 C7 C8
R1
R2
C13 C14 C15 C5 C18 C17
A

– CNN SUB –

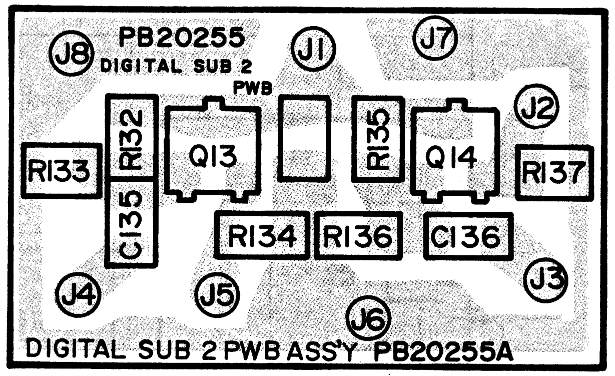

CN1 1 CN2 8
2 1
7
A
C1 C2 C3 C4 C5 C6 C7 C8 C9
C10
PB40032A-01
CNN S PWB ASS'Y 6 5


DIGITAL PWB ASS'Y
PB10099 A-06
LC2
LC40
IC13
IC14
IC15
IC6
IC17
IC18
IC12
IC11
IC10
IC7
IC16
IC19
IC22
IC23
C106
C108
C110
C117
CF1
LC39
LC38
TH1
X3
DIGITAL PWB
PB10099-01-04
LC35
LC37
R73
R73
CLOCK ADJ

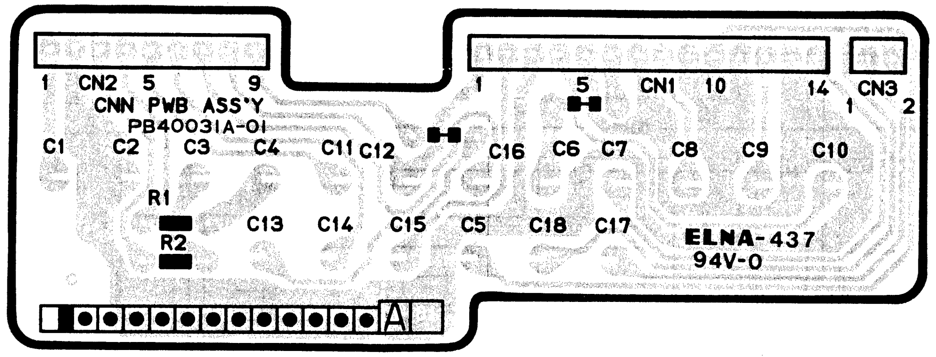
– DIGITAL SUB –


PB40026 A-02
J7 D.SUB PWB ASS'Y
D.SUB PWB
J4 J5 J2 J1
D4 D1 R1 R2 D2
D3
R3
D5
Q2
B
E
J6
Q1 J3
PB40026
-01-01

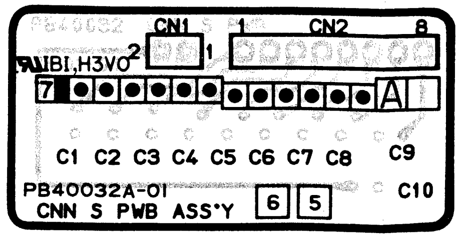
– DIGITAL SUB 2 –

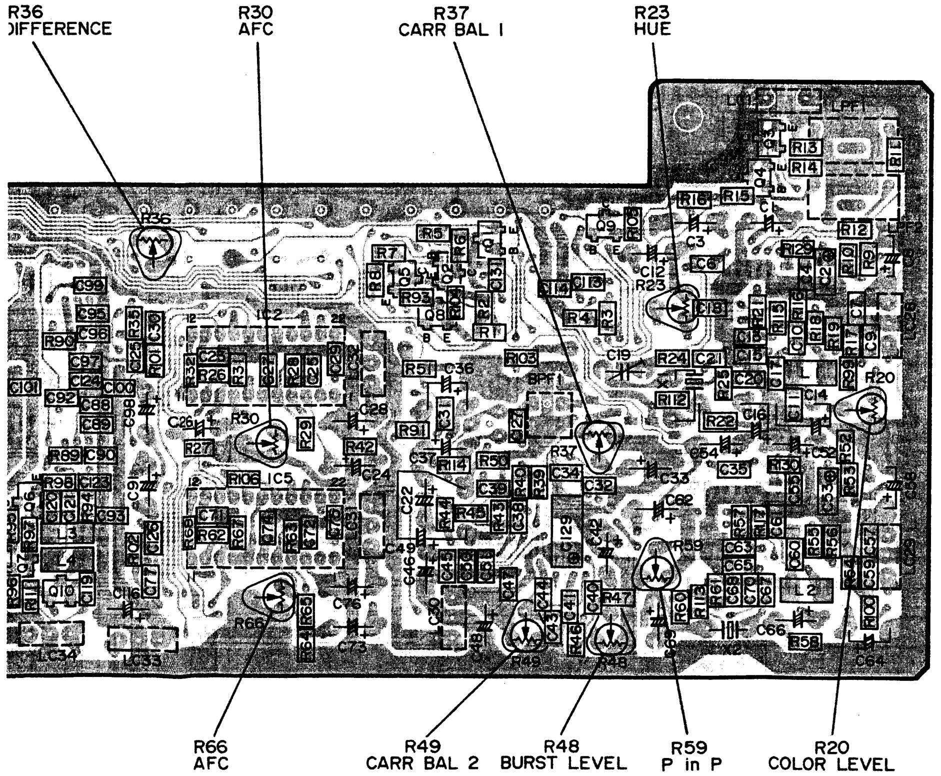

J8
PB20255
DIGITAL SUB 2
PWB
J1
J7
J2
R133
R132
Q13
R135
Q14
R137
C135
R134
R136
C136
J4
J5
J6
J3
DIGITAL SUB 2 PWB ASS'Y PB20255A

– CNN –

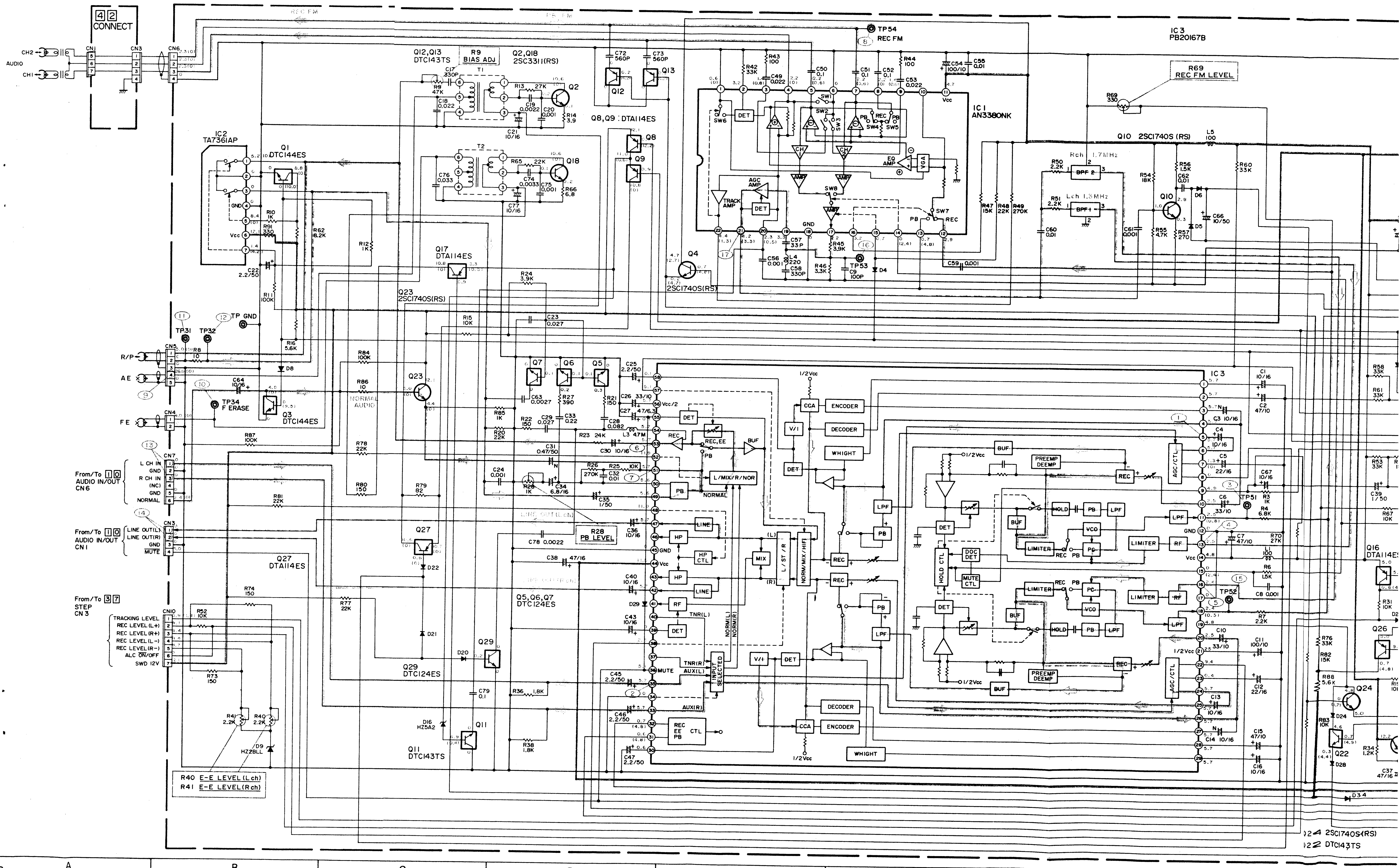

1 CN2 5 9
1 5 CN1 10 14
CN3 1 2
CNN PWB ASS'Y
PB40031A-01
C1 C2 C3 C4 C11 C12 C16 C6 C7 C8 C9 C10
R1
R2
C13 C14 C15 C5 C18 C17
ELNA-437
94V-0
A

– CNN SUB –

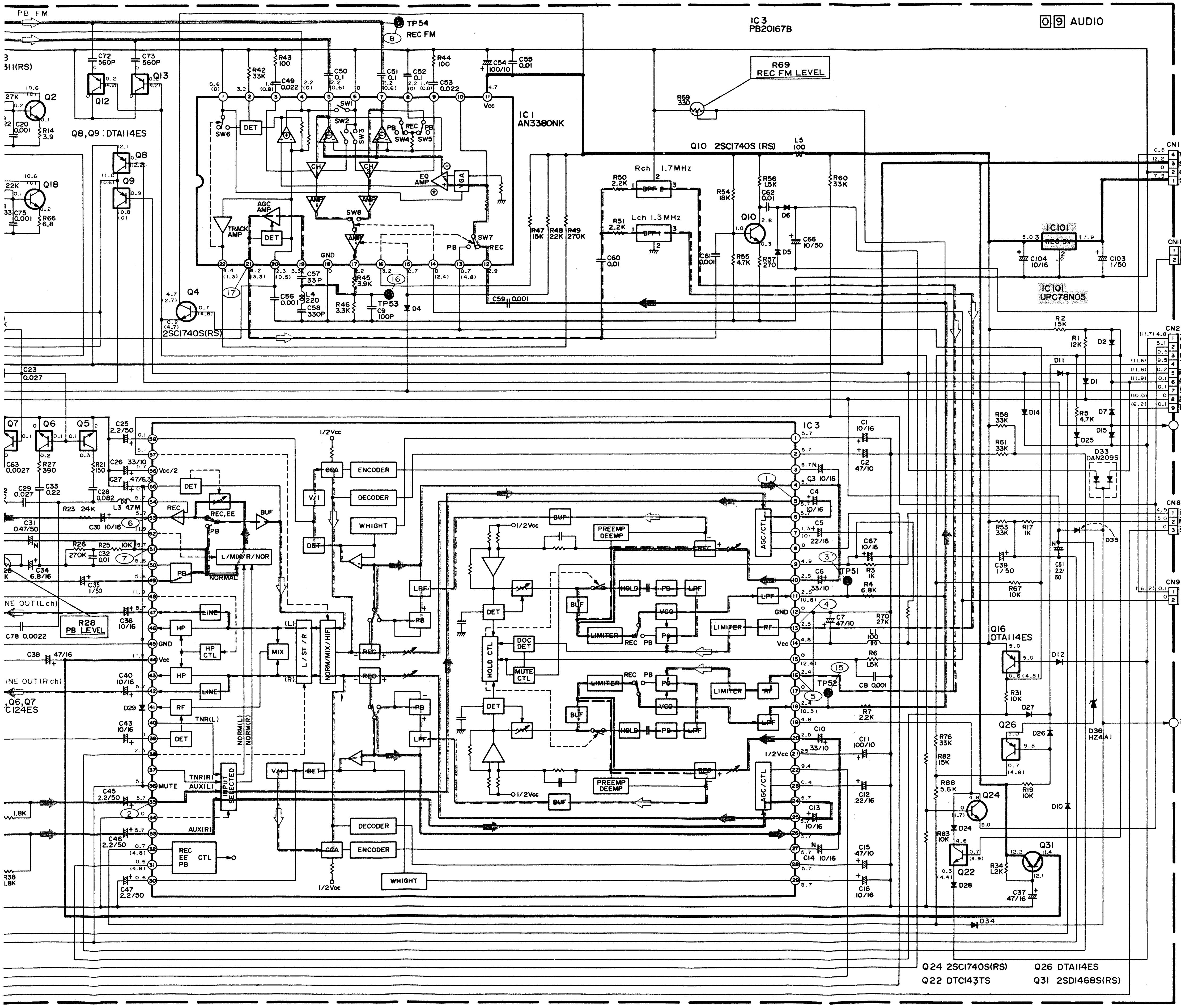

CN1 1 CN2 8
2 1
7
A
C1 C2 C3 C4 C5 C6 C7 C8 C9
C10
PB40032A-01
CNN S PWB ASS'Y
6 5


R36
DIFFERENCE
R30
AFC
R37
CARR BAL 1
R23
HUE
R66
AFC
R49
CARR BAL 2
R48
BURST LEVEL
R59
P in P
R20
COLOR LEVEL
IC2
IC5
LC33
LC34

3.25 AUDIO SCHEMATIC DIAGRAM

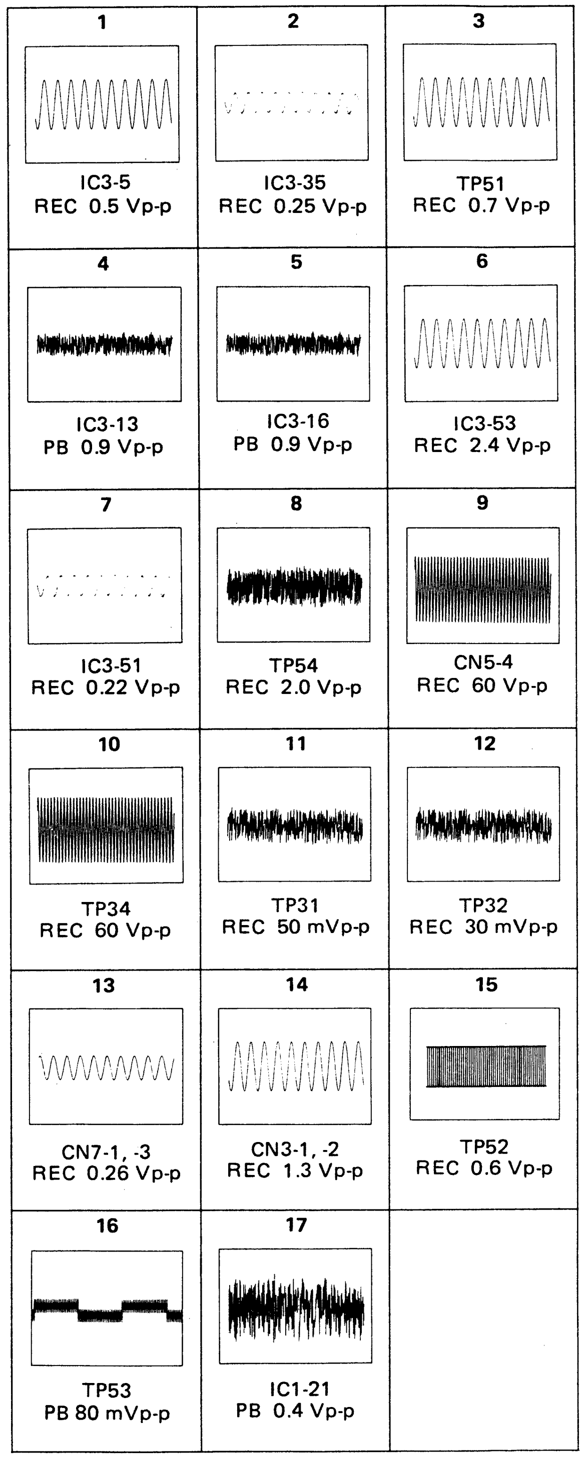


42 CONNECT
CN1
CN3
CN6
AUDIO
CH2
CH1
REC FM
PB FM
Q12,Q13 DTC143TS
R9 BIAS ADJ
Q2,Q18 2SC3311(RS)
T1
T2
Q2
Q18
Q12
Q13
Q8,Q9 : DTA114ES
Q8
Q9
TP54 REC FM
IC1 AN3380NK
IC3 PB20167B
R69 REC FM LEVEL
Q10 2SC1740S (RS)
Rch 1.7MHz
Lch 1.3MHz
BPF 2
BPF 1
IC2 TA7361AP
Q1 DTC144ES
Vcc
GND
Q17 DTA114ES
Q23 2SC1740S(RS)
Q4
2SC1740S(RS)
TP53
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
DET
AGC AMP
TRACK AMP
EQ AMP
VGA
AMP
REC
PB
TP31
TP32
TP GND
R/P
AE
FE
CN5
CN4
TP34 F ERASE
Q3 DTC144ES
D8
NORMAL AUDIO
Q7
Q6
Q5
Q5,Q6,Q7 DTC124ES
R28 PB LEVEL
LINE OUT(L.CH)
From/To 10 AUDIO IN/OUT CN6
L CH IN
GND
R CH IN
(NC)
NORMAL
CN7
From/To 10 AUDIO IN/OUT CN1
LINE OUT(L)
LINE OUT(R)
MUTE
Q27
Q27 DTA114ES
D22
D21
From/To 37 STEP CN3
CN10
TRACKING LEVEL
REC LEVEL (L+)
REC LEVEL (R+)
REC LEVEL (L−)
REC LEVEL (R−)
ALC ON/OFF
SWD 12V
Q29
Q29 DTC124ES
D20
D16 HZ5A2
Q11
Q11 DTC143TS
D9 HZ2BLL
R40 E-E LEVEL(L ch)
R41 E-E LEVEL(R ch)
1/2Vcc
CCA
ENCODER
DECODER
WHIGHT
V/I
BUF
L/MIX/R/NOR
REC,EE
LINE
HP
HP CTL
MIX
L/ST/R
NORM/MIX/HIFI
RF
TNR(L)
TNR(R)
AUX(L)
AUX(R)
MUTE
INPUT SELECTED
NORM(L)
NORM(R)
REC EE PB CTL
LPF
PREEMP DEEMP
HOLD
HOLD CTL
DOC DET
MUTE CTL
VCO
PC
LIMITER
AGC/CTL
TP51
TP52
Q16 DTA114ES
Q26
Q24
Q22
D24
D28
D34
Q24 2SC1740S(RS)
Q22 DTC143TS

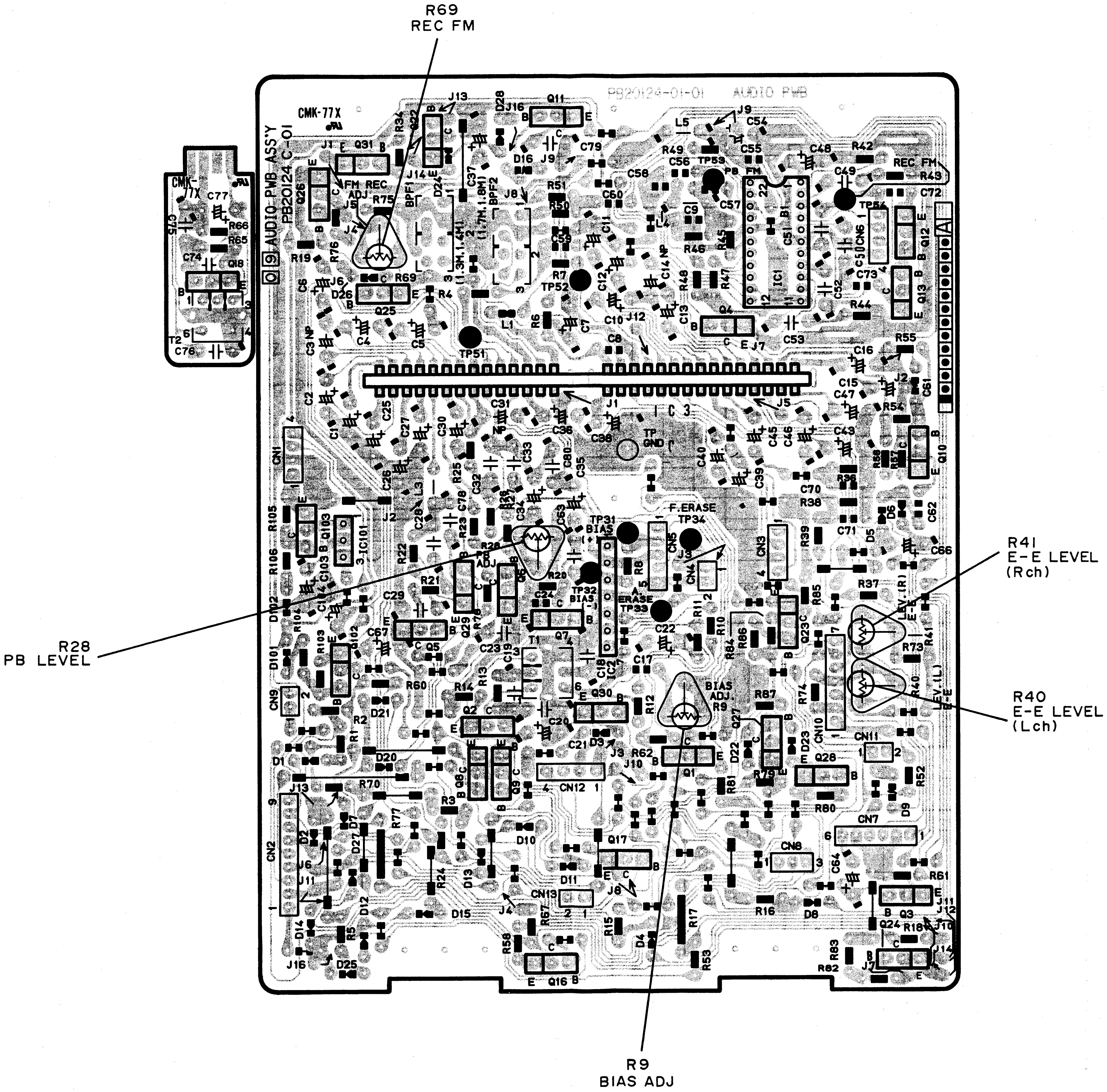


09 AUDIO
PB FM
TP54
REC FM
IC3
PB20167B
R69
REC FM LEVEL
IC1
AN3380NK
Q8,Q9 : DTA114ES
Q10 2SC1740S (RS)
Rch 1.7MHz
Lch 1.3MHz
BPF 2
BPF 1
Q4
2SC1740S(RS)
TP53
IC101
REG 5V
UPC78N05
From/To 02
SWITCHING
POWER SUPPLY(2)
CN13
CN1
POWER ON/OFF
SWD 12V
GND
SEMI REG 7V
To 27
DISPLAY
CN7
CN11
NC
-30V
From/To 04
MECHACON
CN7
CN2
AUDIO DUB
MON SELECT
POWER ON/OFF
INSERT
REC
REC START
SP
EE
EE
AUDIO BIAS
To 03
VIDEO,CN15
D33
DAN209S
From/To 04
MECHACON
CN8
DO CTL
MUTE
SPECIAL CASS
From/To 03
MAIN (VIDEO)
CN15
CN9
EE
AUDIO FF
To 49
SYNC SEP,CN103
M I REC
Q16
DTA114ES
D36
HZ4A1
Q26
Q24
Q22
Q31
TP51
TP52
R28
PB LEVEL
LINE OUT(Lch)
LINE OUT(Rch)
Q6,Q7
DTC124ES
ENCODER
DECODER
WHIGHT
L/MIX/R/NOR
L / ST / R
NORM/MIX/HIFI
INPUT SELECTED
AGC/CTL
PREEMP DEEMP
LIMITER
HOLD CTL
DOC DET
MUTE CTL
REC EE PB CTL
Q24 2SC1740S(RS)
Q22 DTC143TS
Q26 DTA114ES
Q31 2SD1468S(RS)
D
E
F
G
H
I
J

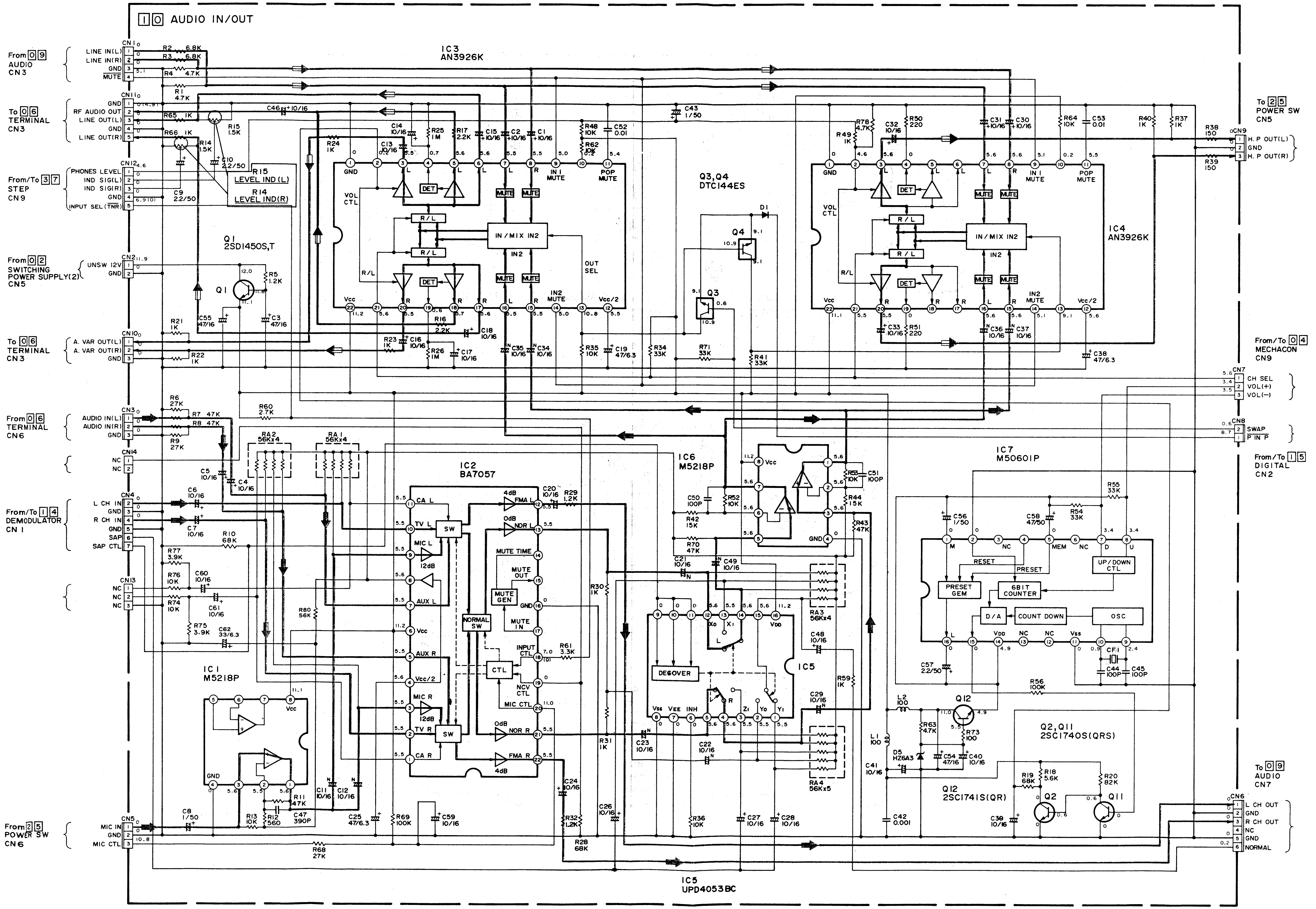
– Waveforms of AUDIO circuit –



3.26 AUDIO CIRCUIT BOARD


R69
REC FM
R28
PB LEVEL
R41
E-E LEVEL
(Rch)
R40
E-E LEVEL
(Lch)
R9
BIAS ADJ
PB20124-01-01 AUDIO PWB
CMK-77X
AUDIO PWB ASS'Y
PB20124 C-01
TP51
TP52
TP53
TP54
TP31 BIAS
TP32 BIAS
TP33 ERASE
TP34 F.ERASE
TP GND
IC1
IC2
IC3
FM REC ADJ
BIAS ADJ
LEV.(R) E-E
LEV.(L) E-E

3.27 AUDIO IN/OUT SCHEMATIC DIAGRAM



10 AUDIO IN/OUT
From 09 AUDIO CN3
LINE IN(L)
LINE IN(R)
GND
MUTE
To 06 TERMINAL CN3
RF AUDIO OUT
LINE OUT(L)
LINE OUT(R)
From/To 37 STEP CN9
PHONES LEVEL
IND SIG(L)
IND SIG(R)
INPUT SEL (TNR)
R15 LEVEL IND(L)
R14 LEVEL IND(R)
From 02 SWITCHING POWER SUPPLY(2) CN5
UNSW 12V
Q1 2SD1450S,T
To 06 TERMINAL CN3
A. VAR OUT(L)
A. VAR OUT(R)
From 06 TERMINAL CN6
AUDIO IN(L)
AUDIO IN(R)
NC
From/To 14 DEMODULATOR CN1
L CH IN
R CH IN
SAP
SAP CTL
IC1 M5218P
From 25 POWER SW CN6
MIC IN
MIC CTL
IC3 AN3926K
VOL CTL
DET
R/L
IN/MIX IN2
MUTE
IN1 MUTE
POP MUTE
OUT SEL
IN2 MUTE
Vcc/2
Q3,Q4 DTC144ES
IC4 AN3926K
IC2 BA7057
CA L
TV L
MIC L
AUX L
Vcc
AUX R
MIC R
TV R
CA R
SW
NORMAL SW
CTL
FMA L
NOR L
NOR R
FMA R
MUTE TIME
MUTE OUT
MUTE GEN
MUTE IN
INPUT CTL
NCV CTL
MIC CTL
12dB
4dB
0dB
IC6 M5218P
IC5 UPD4053BC
DECOVER
INH
VEE
Vss
VDD
RA1 56Kx4
RA2 56Kx4
RA3 56Kx4
RA4 56Kx5
IC7 M50601P
PRESET GEM
6BIT COUNTER
D/A
COUNT DOWN
OSC
UP/DOWN CTL
RESET
PRESET
MEM
Q12 2SC1741S(QR)
Q2,Q11 2SC1740S(QRS)
D5 HZ6A3
To 25 POWER SW CN5
H. P OUT(L)
H. P OUT(R)
From/To 04 MECHACON CN9
CH SEL
VOL(+)
VOL(−)
SWAP
P IN P
From/To 15 DIGITAL CN2
To 09 AUDIO CN7
L CH OUT
R CH OUT
NORMAL
A
B
C
D
E
F
G
H
1
2
3
4
5
6

6

3.28 AUDIO IN/OUT CIRCUIT BOARD

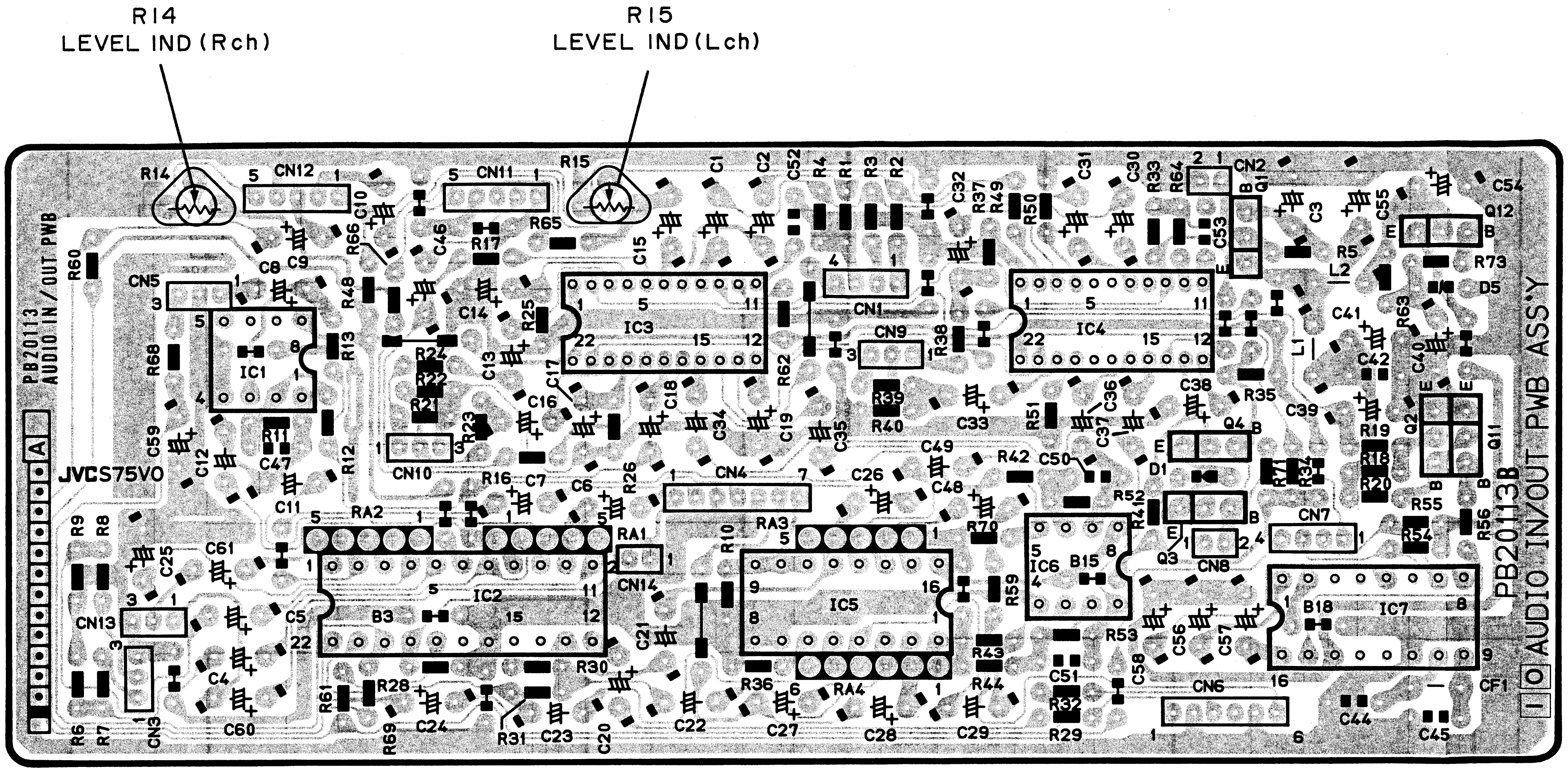
5

4

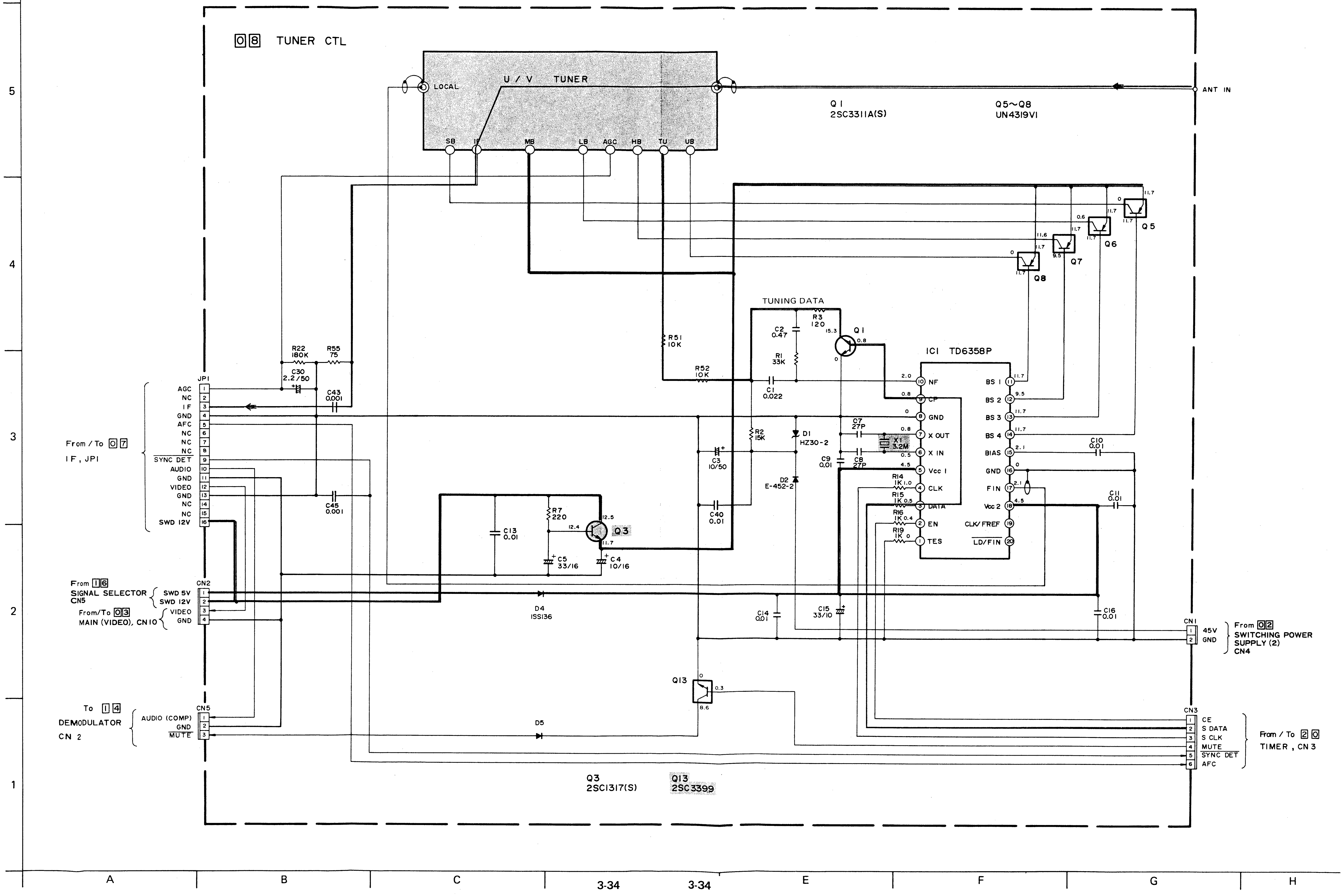
3

2

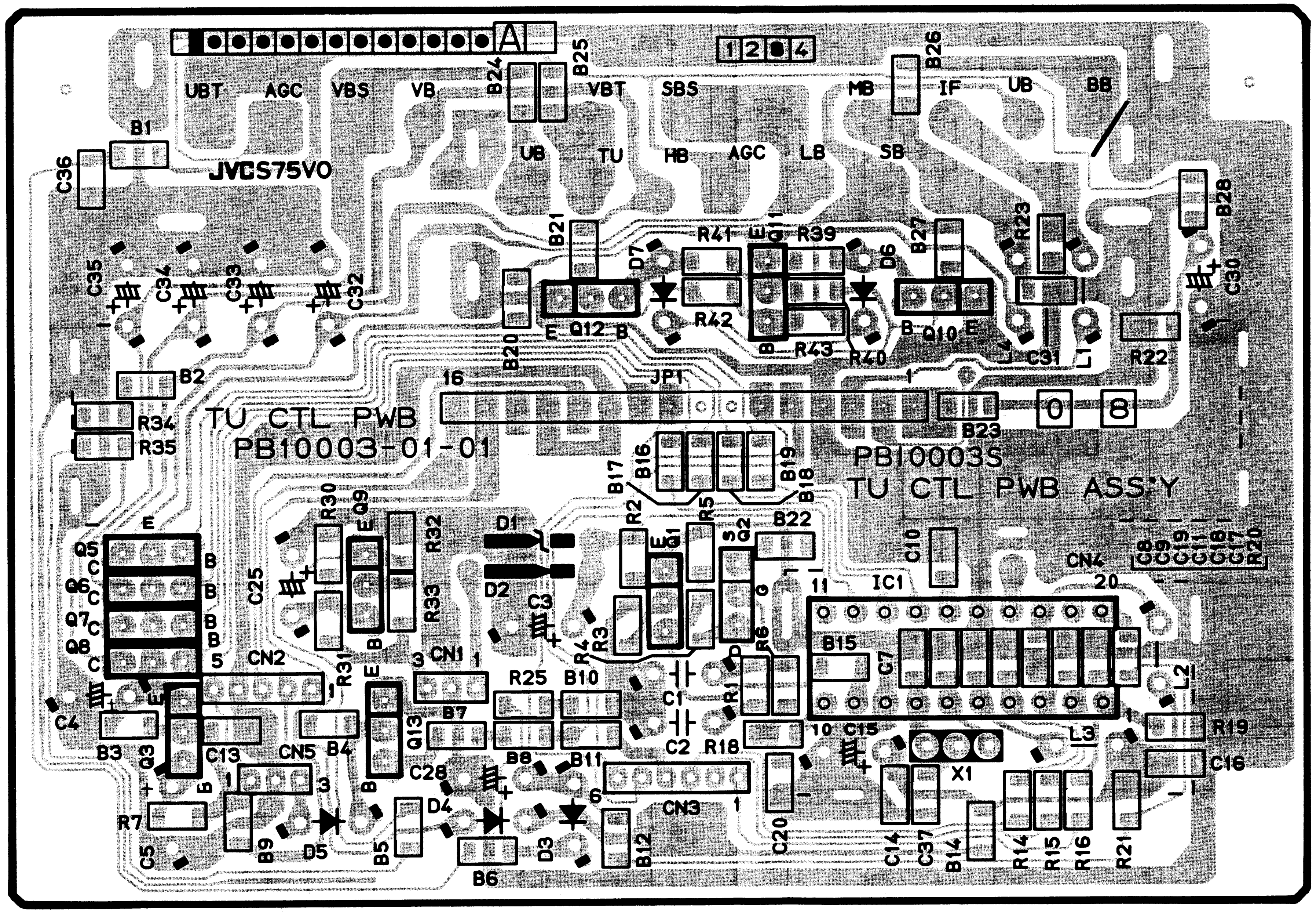
1


R14
LEVEL IND (Rch)
R15
LEVEL IND (Lch)
PB20113
AUDIO IN/OUT PWB
JVCS75V0
A
PB20113B
AUDIO IN/OUT PWB ASS'Y
I O
IC1
IC2
IC3
IC4
IC5
IC6
IC7
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
RA1
RA2
RA3
RA4
Q1
Q2
Q3
Q4
Q11
Q12
D1
D5
L1
L2
CF1
B3
B15
B18

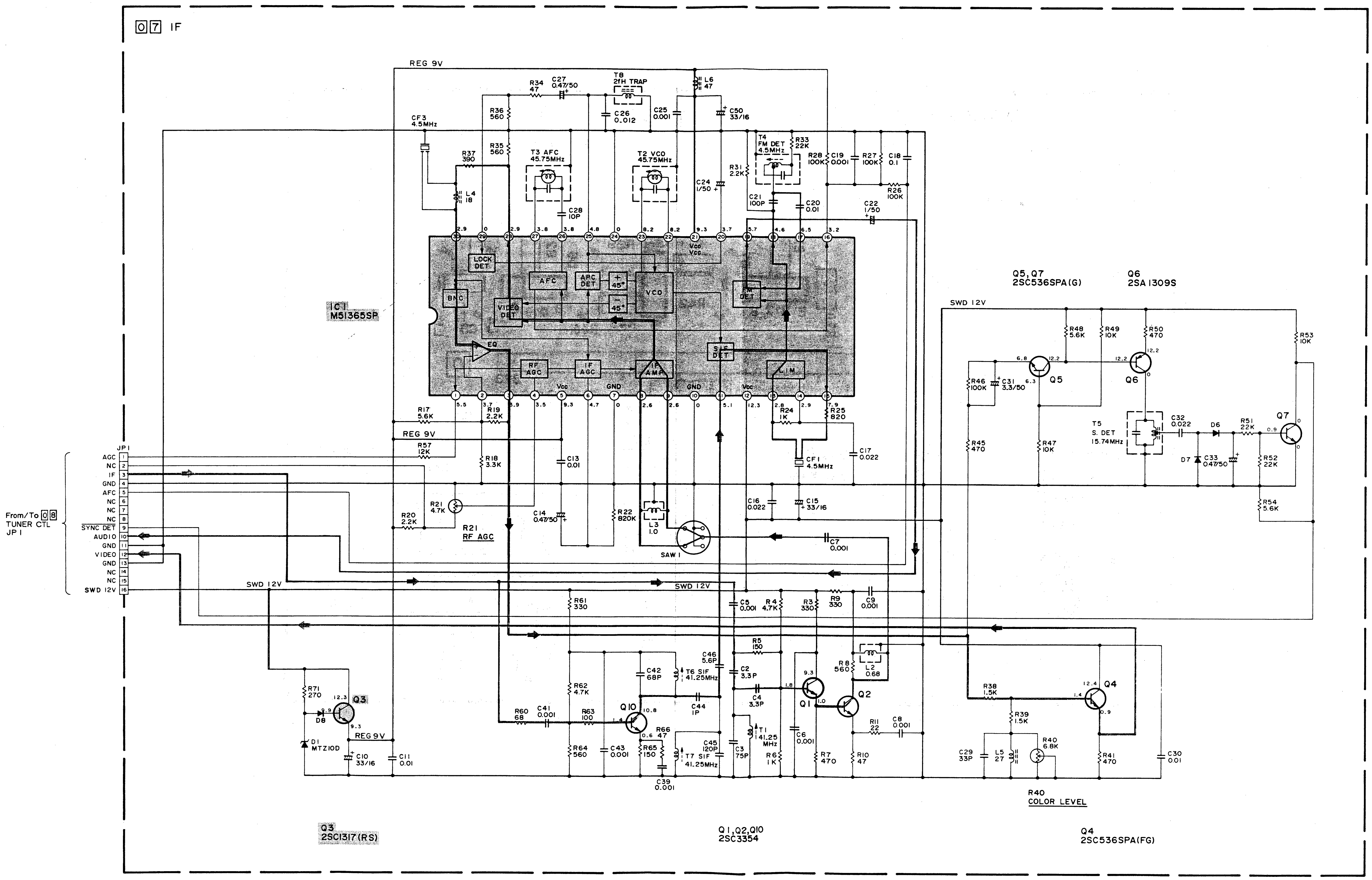
3.29 TUNER CONTROL SCHEMATIC DIAGRAM


08 TUNER CTL
U / V TUNER
LOCAL
SB
IF
MB
LB
AGC
HB
TU
UB
ANT IN
Q1
2SC3311A(S)
Q5~Q8
UN4319V1
Q5
Q6
Q7
Q8
TUNING DATA
R3
120
C2
0.47
R1
33K
R51
10K
R52
10K
C1
0.022
R2
15K
D1
HZ30-2
D2
E-452-2
C3
10/50
C40
0.01
C7
27P
C8
27P
C9
0.01
X1
3.2M
IC1 TD6358P
NF
CP
GND
X OUT
X IN
Vcc 1
CLK
DATA
EN
TES
BS 1
BS 2
BS 3
BS 4
BIAS
GND
FIN
Vcc 2
CLK/FREF
LD/FIN
R14
1K
R15
1K
R16
1K
R19
1K
C10
0.01
C11
0.01
R22
180K
R55
75
C30
2.2/50
C43
0.001
C45
0.001
C13
0.01
R7
220
Q3
C5
33/16
C4
10/16
JP1
AGC
NC
IF
GND
AFC
NC
NC
NC
SYNC DET
AUDIO
GND
VIDEO
GND
NC
NC
SWD 12V
From / To 07
IF, JP1
From 16
SIGNAL SELECTOR
CN5
CN2
SWD 5V
SWD 12V
From/To 03
MAIN (VIDEO), CN10
VIDEO
GND
D4
1SS136
C14
0.01
C15
33/10
C16
0.01
CN1
45V
GND
From 02
SWITCHING POWER
SUPPLY (2)
CN4
Q13
D5
To 14
DEMODULATOR
CN 2
CN5
AUDIO (COMP)
GND
MUTE
CN3
CE
S DATA
S CLK
MUTE
SYNC DET
AFC
From / To 20
TIMER, CN 3
Q3
2SC1317(S)
Q13
2SC3399
1
2
3
4
5
6
A
B
C
E
F
G
H

3.30 TUNER CONTROL CIRCUIT BOARD

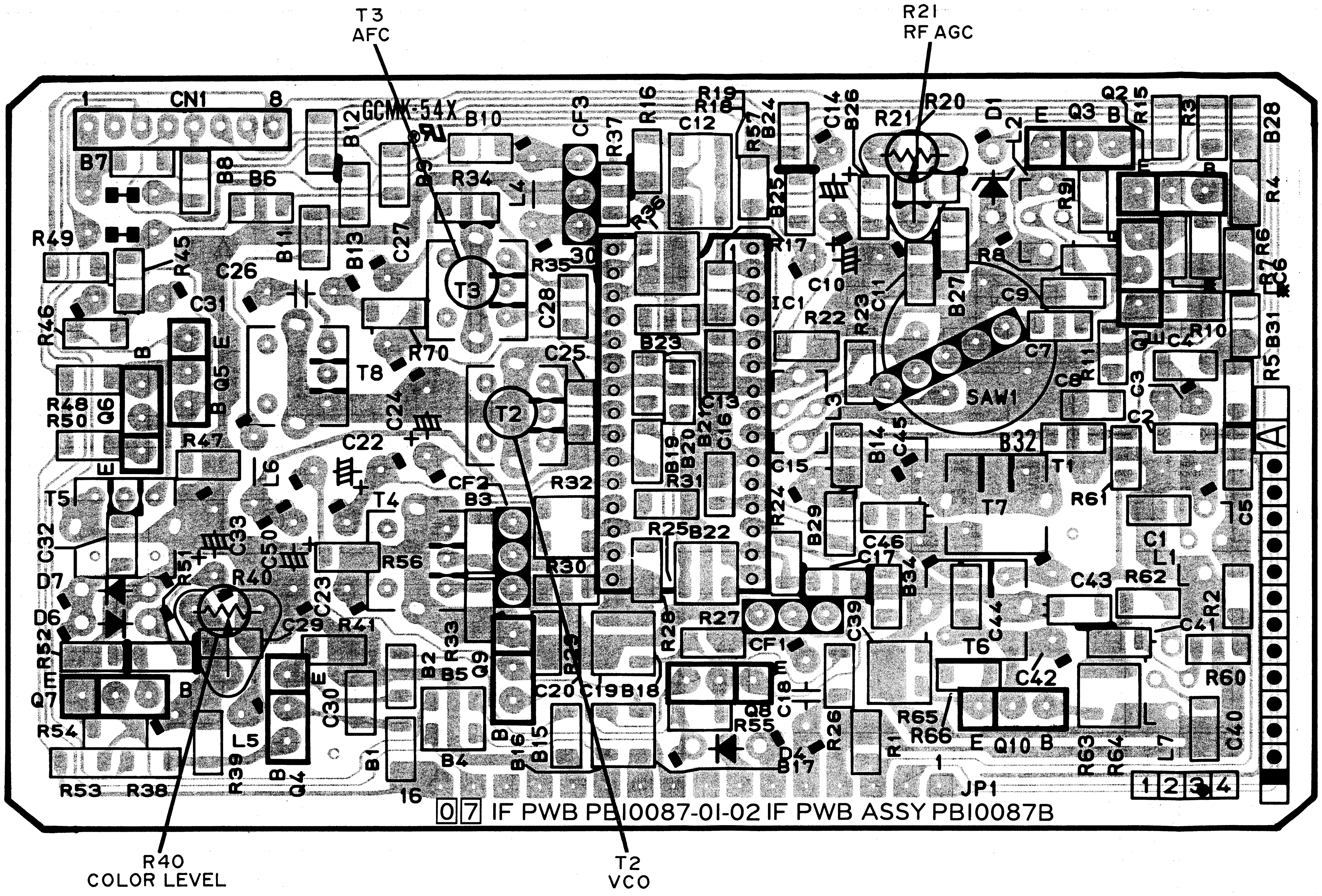

UBT
AGC
VBS
VB
VBT
SBS
MB
IF
UB
BB
UB
TU
HB
AGC
LB
SB
JVC S75VO
TU CTL PWB
PB10003-01-01
PB10003S
TU CTL PWB ASS'Y
JP1
IC1
CN1
CN2
CN3
CN4
CN5
X1
L1
L2
L3
Q1
Q2
Q3
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
D1
D2
D3
D4
D5
D6
D7
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
B14
B15
B16
B17
B18
B19
B20
B21
B22
B23
B24
B25
B26
B27
B28
R1
R2
R3
R4
R5
R6
R7
R14
R15
R16
R18
R19
R20
R21
R22
R23
R25
R30
R31
R32
R33
R34
R35
R39
R40
R41
R42
R43
C1
C2
C3
C4
C5
C7
C8
C9
C10
C11
C13
C14
C15
C16
C17
C18
C19
C20
C25
C28
C30
C31
C32
C33
C34
C35
C36
C37
E
B
C
0
8
1
2
3
4
16
1
11
20
10
1
5
3
6

3.31 IF SCHEMATIC DIAGRAM

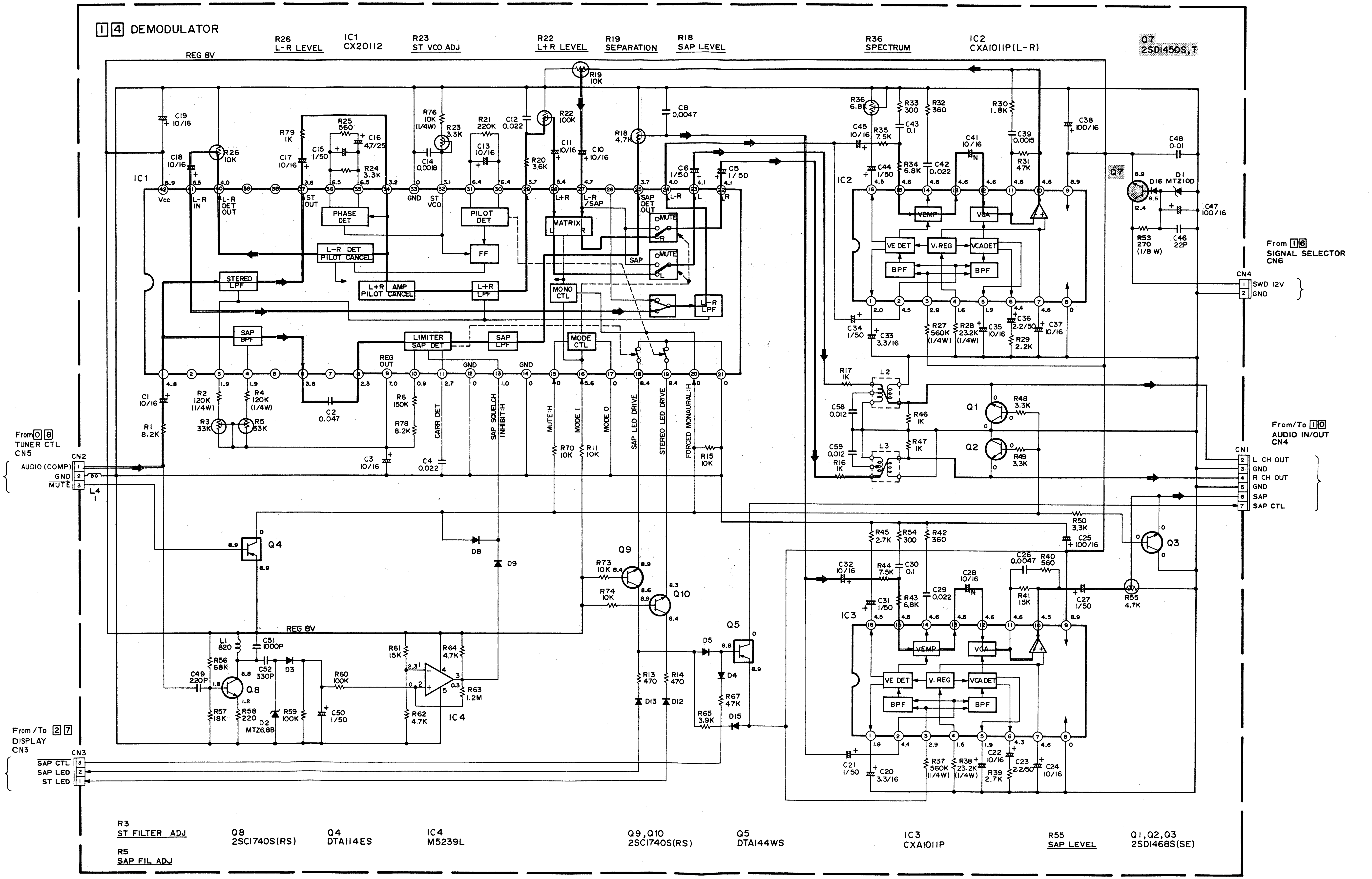


07 IF
REG 9V
R34 47
C27 0.47/50
T8 2fH TRAP
L6 47
R36 560
C26 0.012
C25 0.001
C50 33/16
CF3 4.5MHz
R37 390
R35 560
T3 AFC 45.75MHz
T2 VCO 45.75MHz
C24 1/50
T4 FM DET 4.5MHz
R33 22K
R28 100K
C19 0.001
R27 100K
C18 0.1
R26 100K
R31 2.2K
C21 100P
C20 0.01
C22 1/50
L4 18
C28 10P
IC1 M51365SP
LOCK DET
BNC
VIDEO DET
AFC
APC DET
+45°
-45°
VCO
FM DET
EQ
RF AGC
IF AGC
IF AMP
SIF DET
LIM
Vcc
GND
R17 5.6K
R19 2.2K
R24 1K
R25 820
R57 12K
R18 3.3K
C13 0.01
C17 0.022
CF1 4.5MHz
R21 4.7K
R21 RF AGC
R20 2.2K
C14 0.47/50
R22 820K
L3 1.0
SAW1
C16 0.022
C15 33/16
C7 0.001
JP1
AGC
NC
IF
GND
AFC
SYNC DET
AUDIO
VIDEO
SWD 12V
From/To 08 TUNER CTL JP1
Q5,Q7 2SC536SPA(G)
Q6 2SA1309S
SWD 12V
R48 5.6K
R49 10K
R50 470
R53 10K
R46 100K
C31 3.3/50
Q5
Q6
T5 S. DET 15.74MHz
C32 0.022
D6
R51 22K
Q7
D7
C33 0.47/50
R52 22K
R45 470
R47 10K
R54 5.6K
R61 330
C5 0.001
R4 4.7K
R3 330
R9 330
C9 0.001
R5 150
C46 5.6P
R8 560
L2 0.68
C42 68P
T6 SIF 41.25MHz
C2 3.3P
C4 3.3P
Q1
Q2
R62 4.7K
C44 1P
Q10
R60 68
C41 0.001
R63 100
R66 47
T1 41.25 MHz
R11 22
C8 0.001
R64 560
C43 0.001
R65 150
C45 120P
T7 SIF 41.25MHz
C3 75P
R6 1K
C6 0.001
R7 470
R10 47
C39 0.001
R71 270
Q3
D8
D1 MTZ10D
REG 9V
C10 33/16
C11 0.01
R38 1.5K
Q4
R39 1.5K
R40 6.8K
C29 33P
L5 27
R41 470
C30 0.01
R40 COLOR LEVEL
Q3 2SC1317(RS)
Q1,Q2,Q10 2SC3354
Q4 2SC536SPA(FG)
6
5
4
3
2
1
A
B
C
D
E
F
G
H

3.32 IF CIRCUIT BOARD

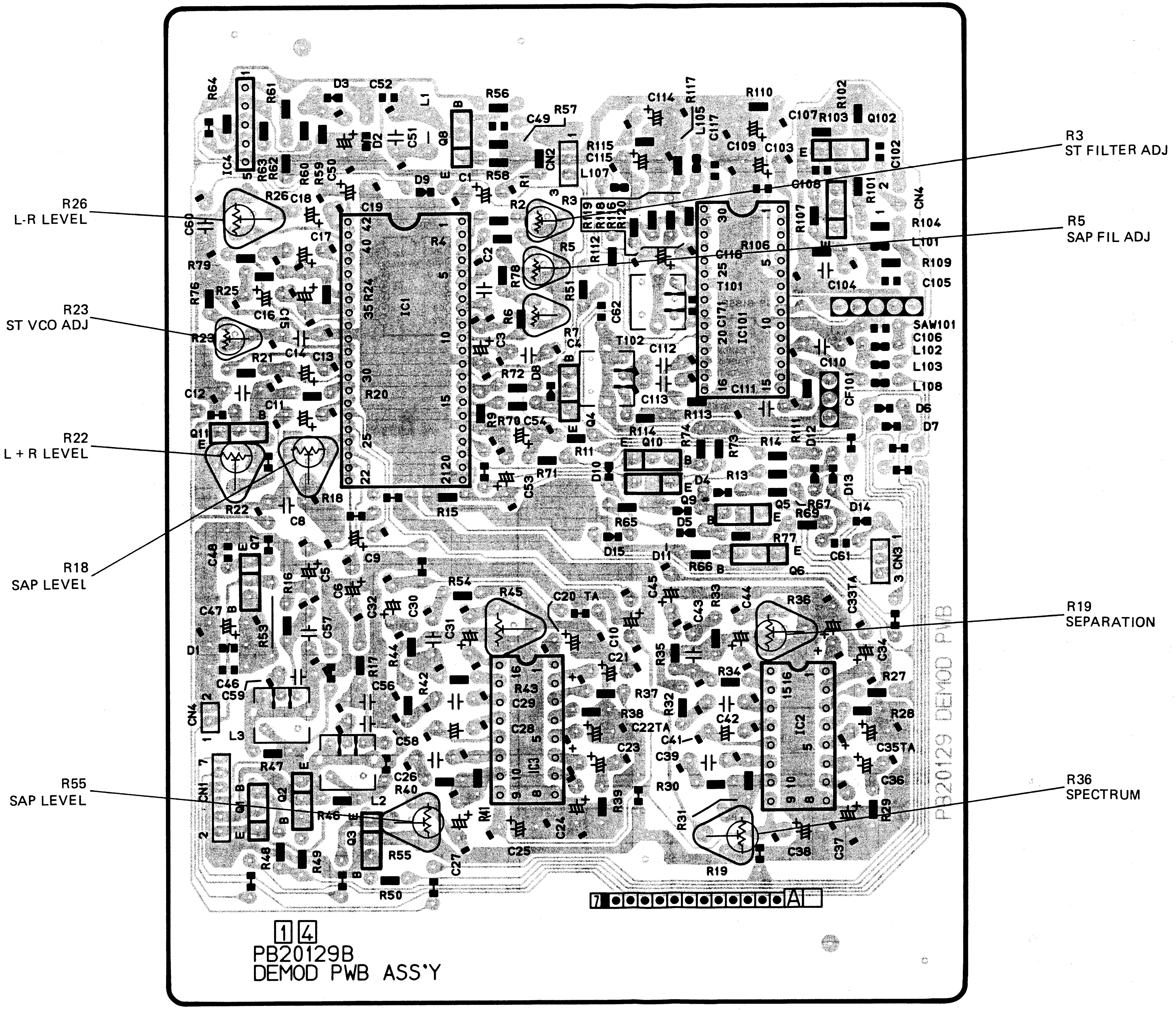

T3
AFC
R21
RF AGC
GCMK-54X
CN1
SAW1
IC1
07 IF PWB PB10087-01-02 IF PWB ASSY PB10087B
R40
COLOR LEVEL
T2
VCO

3.33 DEMODULATOR SCHEMATIC DIAGRAM

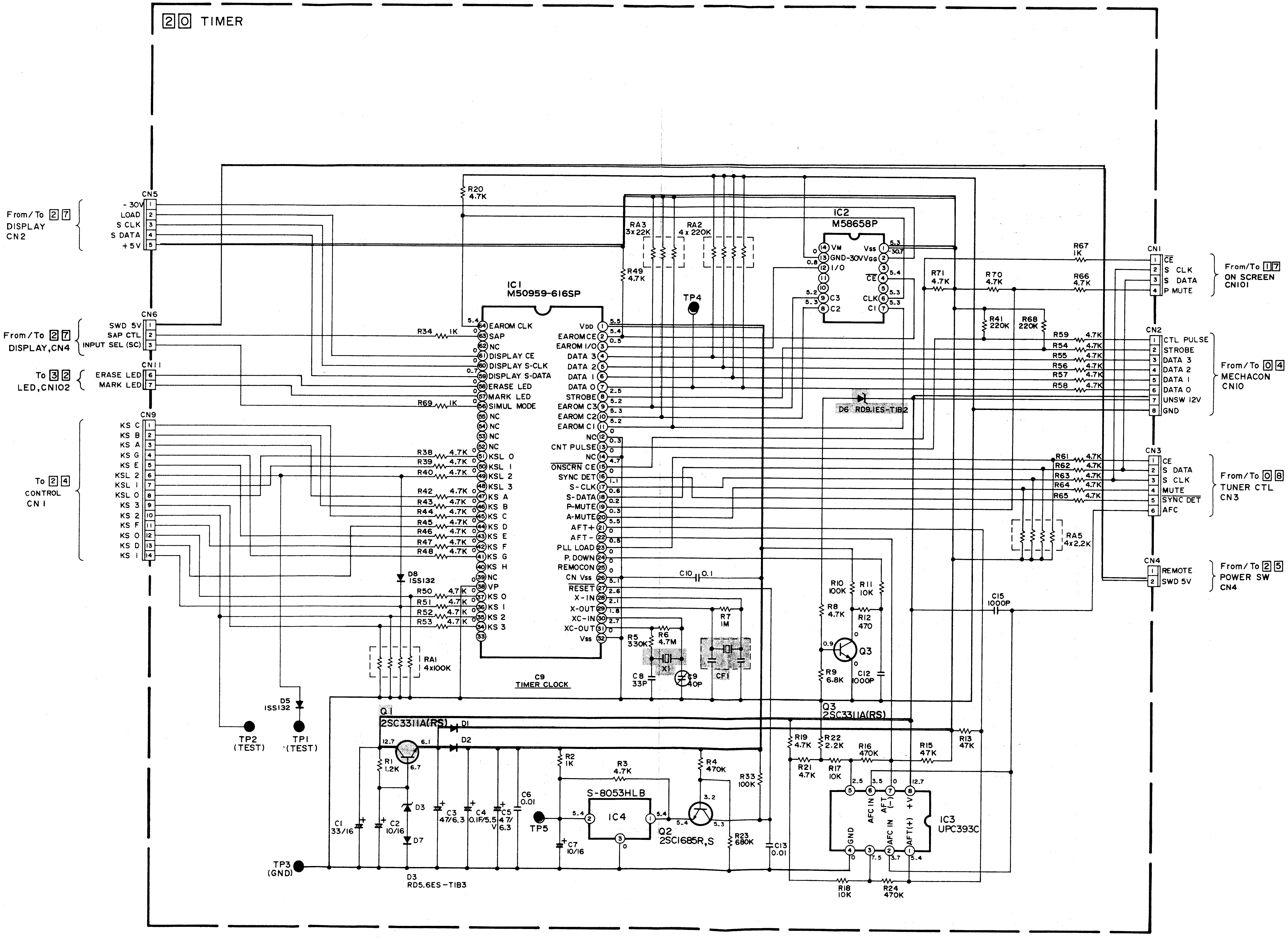


1 4 DEMODULATOR
REG 8V
R26 L-R LEVEL
IC1 CX20112
R23 ST VCO ADJ
R22 L+R LEVEL
R19 SEPARATION
R18 SAP LEVEL
R36 SPECTRUM
IC2 CXA1011P(L-R)
Q7 2SD1450S,T
PHASE DET
PILOT DET
L-R DET PILOT CANCEL
FF
STEREO LPF
L+R AMP PILOT CANCEL
L+R LPF
MATRIX
MUTE
SAP
MONO CTL
L-R LPF
SAP BPF
LIMITER SAP DET
SAP LPF
MODE CTL
VEMP
VCA
VE DET
V.REG
VCA DET
BPF
Vcc
L-R IN
L-R DET OUT
ST OUT
GND
ST VCO
L+R
L-R /SAP
SAP DET OUT
REG OUT
CARR DET
SAP SQUELCH INHIBIT:H
MUTE:H
MODE I
MODE O
SAP LED DRIVE
STEREO LED DRIVE
FORCED MONAURAL:H
From 0 8 TUNER CTL CN5
CN2
AUDIO (COMP)
GND
MUTE
L4
From 1 6 SIGNAL SELECTOR CN6
CN4
SWD 12V
GND
From/To 1 0 AUDIO IN/OUT CN4
CN1
L CH OUT
GND
R CH OUT
GND
SAP
SAP CTL
From/To 2 7 DISPLAY CN3
CN3
SAP CTL
SAP LED
ST LED
Q1
Q2
Q3
Q4
Q5
Q8
Q9
Q10
IC3
IC4
L1
L2
L3
D1 MTZ10D
D2 MTZ6.8B
R3 ST FILTER ADJ
R5 SAP FIL ADJ
Q8 2SC1740S(RS)
Q4 DTA114ES
IC4 M5239L
Q9,Q10 2SC1740S(RS)
Q5 DTA144WS
IC3 CXA1011P
R55 SAP LEVEL
Q1,Q2,Q3 2SD1468S(SE)
6
5
4
3
2
1
A
B
C
E
F
G
H

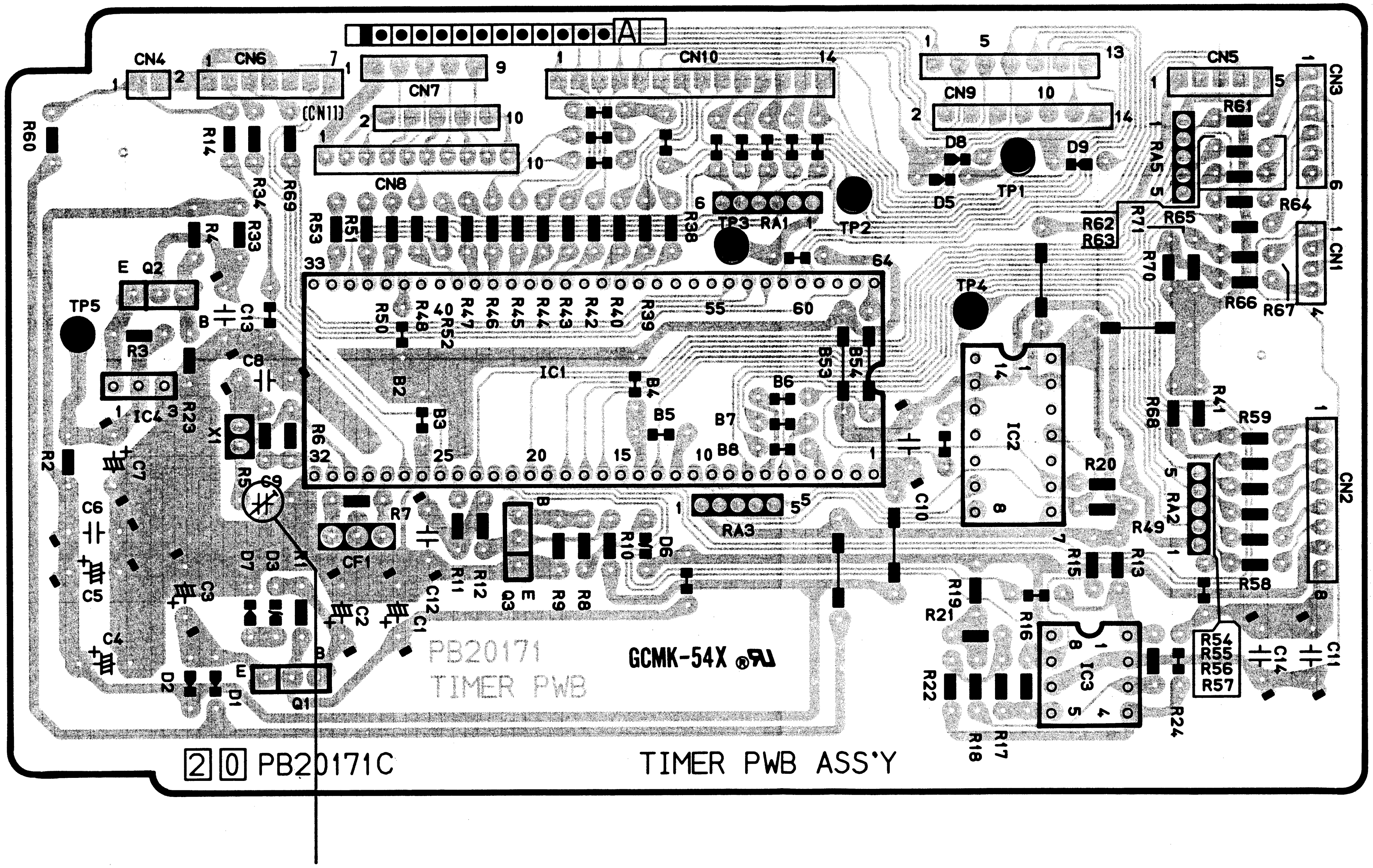
3.34 DEMODULATOR CIRCUIT BOARD


R26
L-R LEVEL
R23
ST VCO ADJ
R22
L + R LEVEL
R18
SAP LEVEL
R55
SAP LEVEL
R3
ST FILTER ADJ
R5
SAP FIL ADJ
R19
SEPARATION
R36
SPECTRUM
IC1
IC101
IC2
IC3
IC4
T101
T102
SAW101
CN1
CN2
CN3
CN4
L1
L2
L3
PB20129 DEMOD PWB
14
PB20129B
DEMOD PWB ASS'Y

3.35 TIMER SCHEMATIC DIAGRAM


20 TIMER
From/To 27 DISPLAY CN2
CN5
-30V
LOAD
S CLK
S DATA
+5V
From/To 27 DISPLAY,CN4
CN6
SWD 5V
SAP CTL
INPUT SEL (SC)
To 32 LED,CN102
CN11
ERASE LED
MARK LED
To 24 CONTROL CN1
CN9
KS C
KS B
KS A
KS G
KS E
KSL 2
KSL 1
KSL 0
KS 3
KS 2
KS F
KS 0
KS D
KS 1
IC1 M50959-616SP
EAROM CLK
SAP
NC
DISPLAY CE
DISPLAY S-CLK
DISPLAY S-DATA
ERASE LED
MARK LED
SIMUL MODE
KSL 0
KSL 1
KSL 2
KSL 3
KS A
KS B
KS C
KS D
KS E
KS F
KS G
KS H
VP
KS 0
KS 1
KS 2
KS 3
VDD
EAROM CE
EAROM I/O
DATA 3
DATA 2
DATA 1
DATA 0
STROBE
EAROM C3
EAROM C2
EAROM C1
CNT PULSE
ONSCRN CE
SYNC DET
S-CLK
S-DATA
P-MUTE
A-MUTE
AFT+
AFT-
PLL LOAD
P. DOWN
REMOCON
CN VSS
RESET
X-IN
X-OUT
XC-IN
XC-OUT
VSS
R20 4.7K
R34 1K
R69 1K
R38 4.7K
R39 4.7K
R40 4.7K
R42 4.7K
R43 4.7K
R44 4.7K
R45 4.7K
R46 4.7K
R47 4.7K
R48 4.7K
R50 4.7K
R51 4.7K
R52 4.7K
R53 4.7K
D8 1SS132
RA1 4x100K
RA3 3x22K
RA2 4x220K
R49 4.7K
TP4
IC2 M58658P
VM
GND-30V
I/O
C3
C2
VSS
VGG
CE
CLK
C1
R67 1K
R71 4.7K
R70 4.7K
R66 4.7K
R41 220K
R68 220K
R59 4.7K
R54 4.7K
R55 4.7K
R56 4.7K
R57 4.7K
R58 4.7K
D6 RD9.1ES-T1B2
R61 4.7K
R62 4.7K
R63 4.7K
R64 4.7K
R65 4.7K
RA5 4x2.2K
CN1
CE
S CLK
S DATA
P MUTE
From/To 17 ON SCREEN CN101
CN2
CTL PULSE
STROBE
DATA 3
DATA 2
DATA 1
DATA 0
UNSW 12V
GND
From/To 04 MECHACON CN10
CN3
CE
S DATA
S CLK
MUTE
SYNC DET
AFC
From/To 08 TUNER CTL CN3
CN4
REMOTE
SWD 5V
From/To 25 POWER SW CN4
C10 0.1
R10 100K
R11 10K
R8 4.7K
R12 470
Q3
R9 6.8K
C12 1000P
C15 1000P
R5 330K
R6 4.7M
R7 1M
X1
CF1
C8 33P
C9 40P
C9 TIMER CLOCK
D5 1SS132
TP2 (TEST)
TP1 (TEST)
Q1 2SC3311A(RS)
D1
D2
R1 1.2K
D3
D7
C1 33/16
C2 10/16
C3 47/6.3
C4 0.1F/5.5V
C5 47/6.3
C6 0.01
TP5
R2 1K
R3 4.7K
S-8053HLB
IC4
R4 470K
Q2 2SC1685R,S
C7 10/16
R33 100K
R23 680K
C13 0.01
TP3 (GND)
D3 RD5.6ES-T1B3
Q3 2SC3311A(RS)
R19 4.7K
R22 2.2K
R16 470K
R15 47K
R13 47K
R21 4.7K
R17 10K
AFC IN
AFT(-)
+V
GND
AFC IN
AFT(+)
IC3 UPC393C
R18 10K
R24 470K

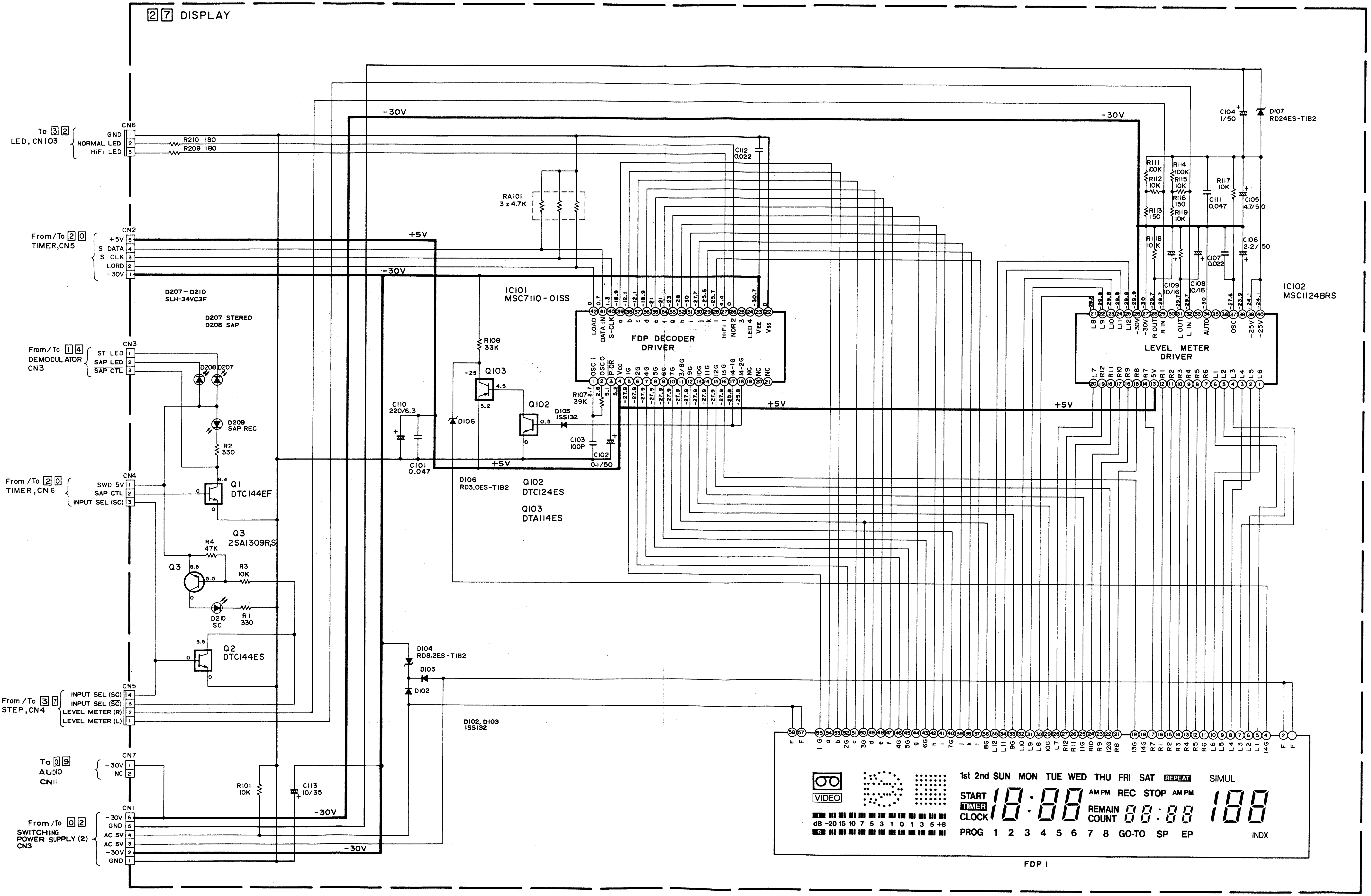
3.36 TIMER CIRCUIT BOARD



CN4
CN6
CN7
CN8
CN10
CN9
CN5
CN3
CN1
CN2
(CN11)
A
IC1
IC2
IC3
IC4
Q1
Q2
Q3
X1
CF1
TP1
TP2
TP3
TP4
TP5
RA1
RA2
RA3
RA5
D1
D2
D3
D5
D6
D7
D8
D9
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R33
R34
R38
R39
R40
R41
R42
R43
R44
R45
R46
R47
R48
R49
R50
R51
R52
R53
R54
R55
R56
R57
R58
R59
R60
R61
R62
R63
R64
R65
R66
R67
R68
R69
R70
R71
B2
B3
B4
B5
B6
B7
B8
B53
B54
PB20171
TIMER PWB
GCMK-54X
2 0 PB20171C
TIMER PWB ASS'Y

C9
TIMER CLOCK

3.37 DISPLAY SCHEMATIC DIAGRAM



27 DISPLAY
To 32 LED, CN103
GND
NORMAL LED
HiFi LED
CN6
R210 180
R209 180
From/To 20 TIMER, CN5
+5V
S DATA
S CLK
LORD
-30V
CN2
D207 – D210 SLH-34VC3F
D207 STEREO
D208 SAP
From/To 14 DEMODULATOR CN3
ST LED
SAP LED
SAP CTL
CN3
D208
D207
D209 SAP REC
R2 330
From /To 20 TIMER, CN6
SWD 5V
SAP CTL
INPUT SEL (SC)
CN4
Q1 DTC144EF
Q3 2SA1309R,S
R4 47K
R3 10K
Q3
D210 SC
R1 330
Q2 DTC144ES
From / To 37 STEP, CN4
INPUT SEL (SC)
INPUT SEL (SC)
LEVEL METER (R)
LEVEL METER (L)
CN5
To 09 AUDIO CN11
-30V
NC
CN7
From /To 02 SWITCHING POWER SUPPLY (2) CN3
-30V
GND
AC 5V
AC 5V
-30V
GND
CN1
R101 10K
C113 10/35
-30V
+5V
RA101 3 x 4.7K
IC101 MSC7110-01SS
FDP DECODER DRIVER
R108 33K
Q103
Q102
D105 1SS132
R107 39K
C110 220/6.3
C101 0.047
D106
C103 100P
C102 0.1/50
D106 RD3.0ES-T1B2
Q102 DTC124ES
Q103 DTA114ES
C112 0.022
D104 RD8.2ES-T1B2
D103
D102
D102, D103 1SS132
C104 1/50
D107 RD24ES-T1B2
R111 100K
R112 10K
R113 150
R114 100K
R115 10K
R116 150
R119 10K
R117 10K
C105 4.7/50
C111 0.047
R118 10K
C109 10/16
C108 10/16
C107 0.022
C106 2.2/50
IC102 MSC1124BRS
LEVEL METER DRIVER
FDP 1
VIDEO
1st 2nd SUN MON TUE WED THU FRI SAT REPEAT SIMUL
START TIMER CLOCK
AM PM REC STOP AM PM
REMAIN COUNT
dB -20 15 10 7 5 3 1 0 1 3 5 +8
PROG 1 2 3 4 5 6 7 8 GO-TO SP EP
INDX
A
B
C
E
F
G
H
1
2
3
4
5
6

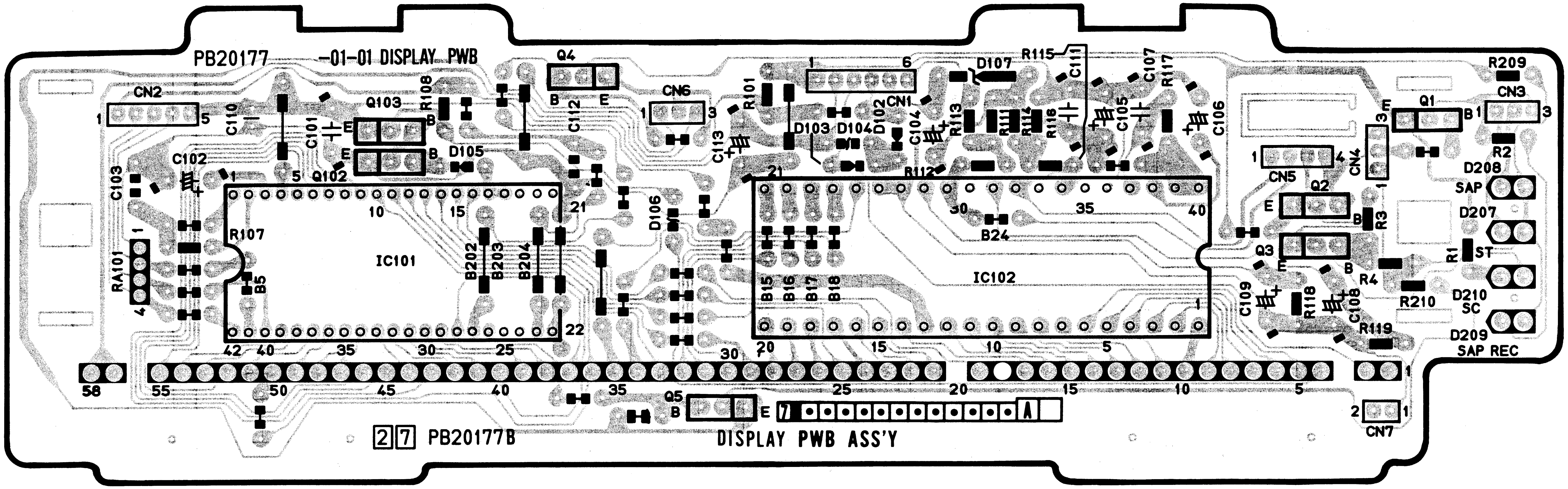
6

3.38 DISPLAY CIRCUIT BOARD

5

4

3

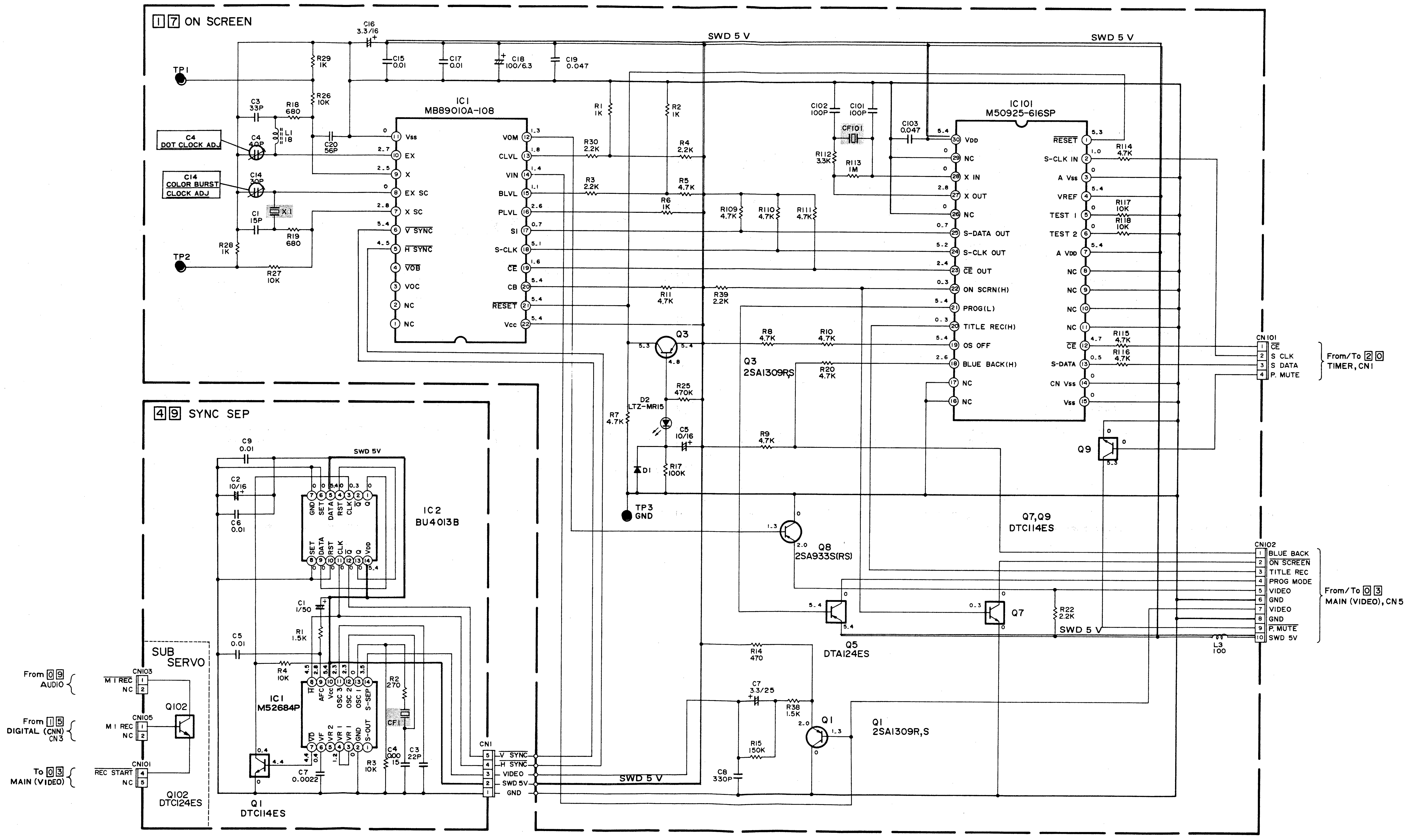

PB20177 -01-01 DISPLAY PWB
CN2
1
5
C110
C101
Q103
R108
Q4
B
E
C112
CN6
1
3
R101
1
6
CN1
D107
R115
C111
C107
R117
C106
R209
Q1
CN3
E
B
1
3
C102
C103
Q102
D105
D103
D104
D102
C104
R113
R111
R114
R116
C105
C113
R112
21
CN5
Q2
CN4
R2
D208
SAP
D207
R107
RA101
IC101
B202
B203
B204
B5
10
15
21
22
42
40
35
30
25
D106
IC102
B24
B15
B16
B17
B18
20
30
35
40
1
Q3
R3
R1
ST
R4
R210
C109
R118
C108
R119
D210
SC
D209
SAP REC
58
55
50
45
35
Q5
CN7
2
2 7 PB20177B
DISPLAY PWB ASS'Y
7
A

2

1

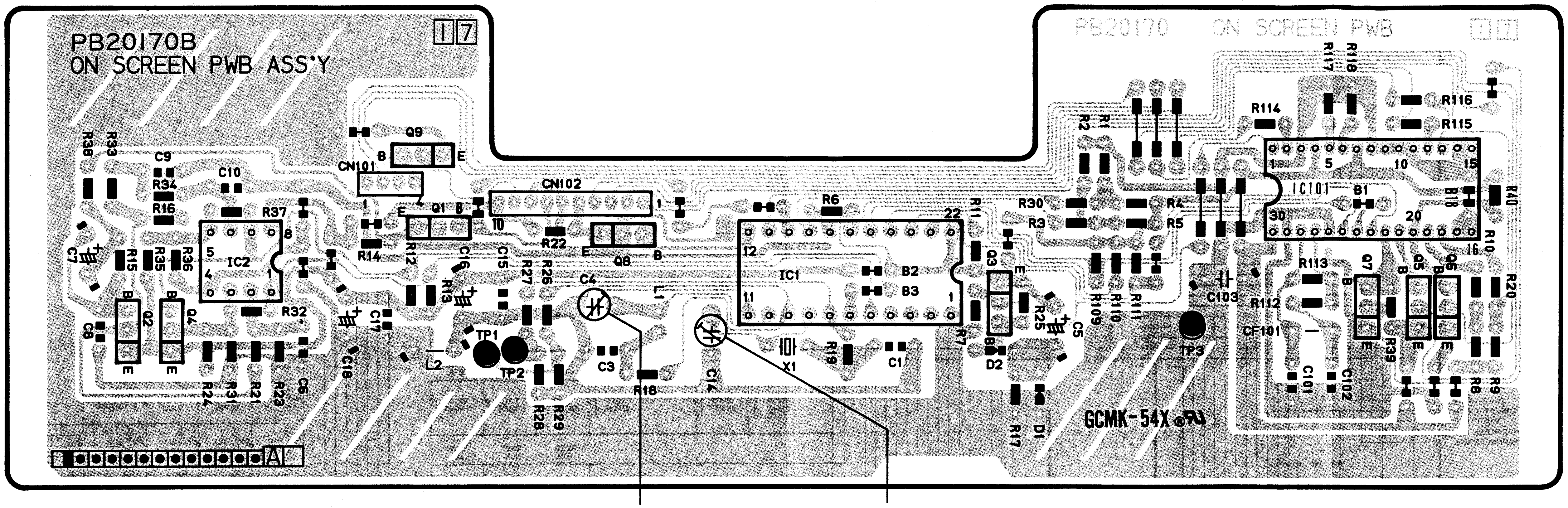
A B C E F G H

3.39 ON SCREEN AND SYNC SEP/SUB SERVO SCHEMATIC DIAGRAMS


17 ON SCREEN
TP1
TP2
TP3 GND
C4 DOT CLOCK ADJ
C14 COLOR BURST CLOCK ADJ
IC1 MB89010A-108
IC101 M50925-616SP
CF101
X1
SWD 5 V
Q3 2SA1309RS
D2 LTZ-MR15
D1
Q8 2SA933S(RS)
Q7,Q9 DTC114ES
Q5 DTA124ES
Q1 2SA1309R,S
CN101
CE
S CLK
S DATA
P. MUTE
From/To 20 TIMER, CN1
CN102
BLUE BACK
ON SCREEN
TITLE REC
PROG MODE
VIDEO
GND
VIDEO
GND
P. MUTE
SWD 5V
From/To 03 MAIN (VIDEO), CN5
49 SYNC SEP
IC2 BU4013B
IC1 M52684P
CF1
Q1 DTC114ES
CN1
V SYNC
H SYNC
VIDEO
SWD 5V
GND
SUB SERVO
From 09 AUDIO
M I REC
NC
CN103
From 15 DIGITAL (CNN) CN3
CN105
To 03 MAIN (VIDEO)
REC START
CN101
Q102 DTC124ES
A
B
C
D
E
F
G
H
1
2
3
4
5

3.40 ON SCREEN AND SYNC SEP/SUB SERVO CIRCUIT BOARDS

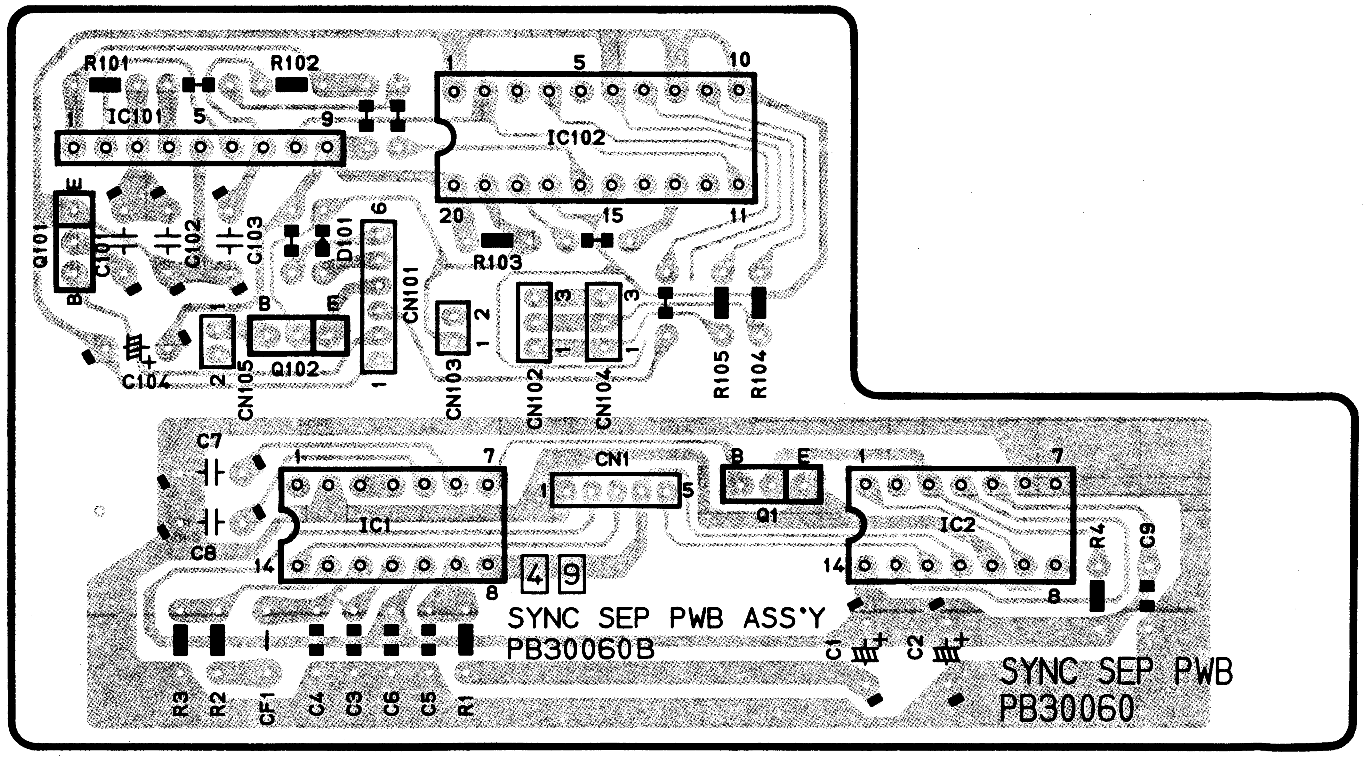
– ON SCREEN –


PB20170B
ON SCREEN PWB ASS'Y
17
PB20170 ON SCREEN PWB
CN101
CN102
IC1
IC2
IC101
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
TP1
TP2
TP3
X1
L1
L2
D1
D2
B1
B2
B3
B18
CF101
C1
C3
C5
C6
C7
C8
C9
C10
C15
C16
C17
C18
C101
C102
C103
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R35
R36
R37
R38
R39
R40
R109
R110
R111
R112
R113
R114
R115
R116
R117
R118
GCMK-54X
A

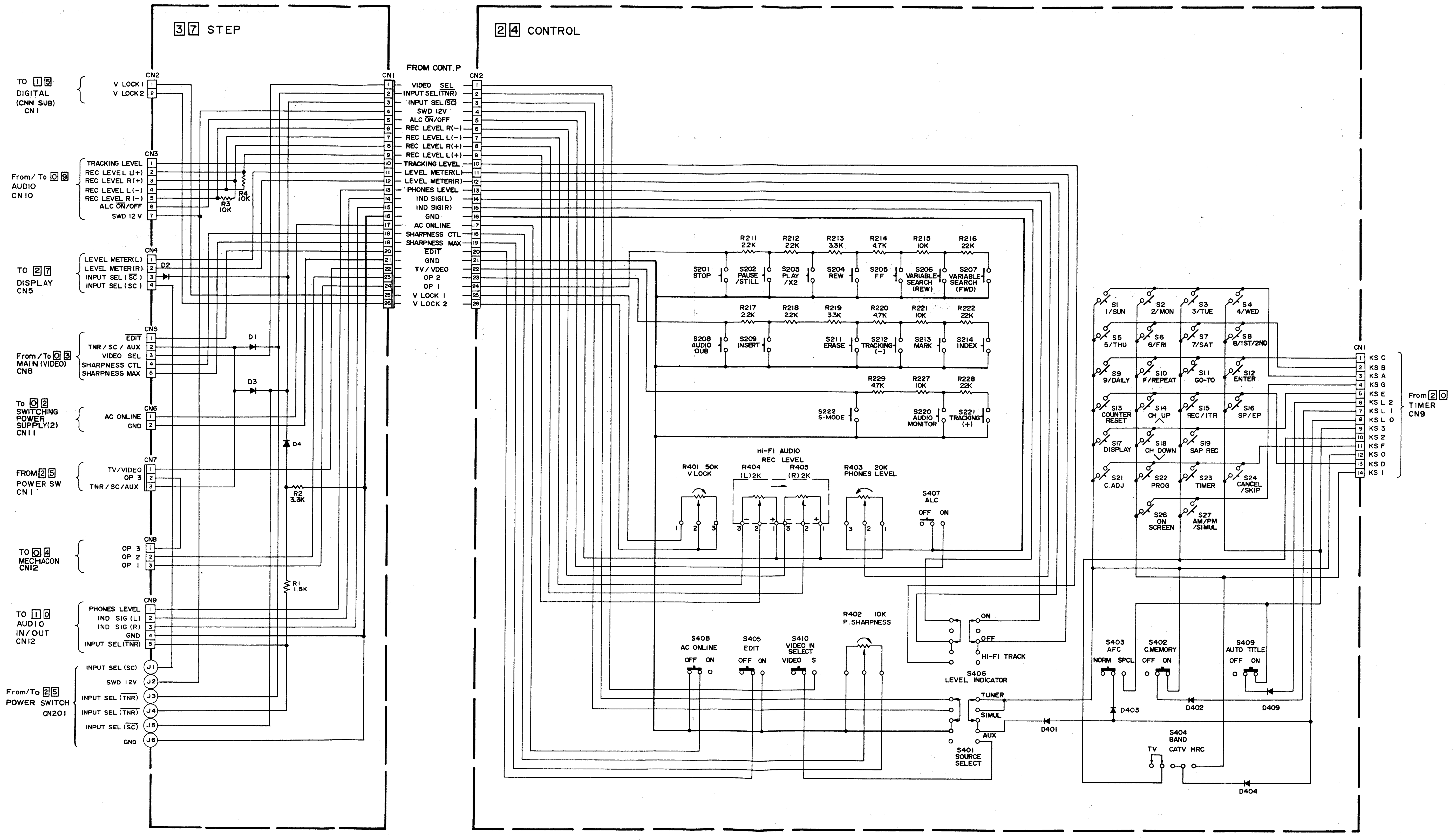
C4
DOT CLK ADJ

C14
COLOR BURST CLK ADJ

– SYNC SEP/SUB SERVO –

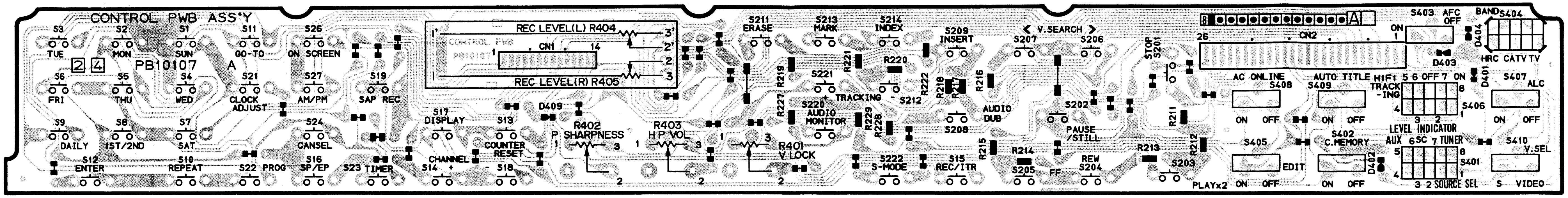

IC101
IC102
R101
R102
R103
R104
R105
Q101
Q102
C101
C102
C103
C104
D101
CN101
CN102
CN103
CN104
CN105
C7
C8
CN1
Q1
IC1
IC2
R4
C9
49
SYNC SEP PWB ASS'Y
PB30060B
C1
C2
SYNC SEP PWB
PB30060
R3
R2
CF1
C4
C3
C6
C5
R1

3.41 CONTROL AND STEP SCHEMATIC DIAGRAMS

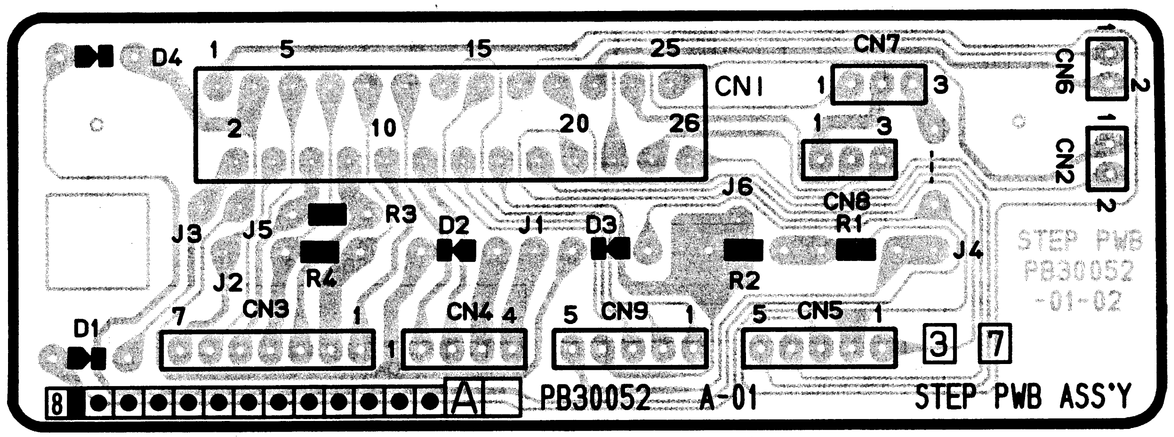

37 STEP
24 CONTROL
TO 15 DIGITAL (CNN SUB) CN1
CN2
V LOCK 1
V LOCK 2
From/To 09 AUDIO CN10
CN3
TRACKING LEVEL
REC LEVEL L(+)
REC LEVEL R(+)
REC LEVEL L(−)
REC LEVEL R(−)
ALC ON/OFF
SWD 12 V
R3 10K
R4 10K
TO 27 DISPLAY CN5
CN4
LEVEL METER(L)
LEVEL METER(R)
INPUT SEL (SC)
INPUT SEL (SC)
D2
From/To 03 MAIN (VIDEO) CN8
CN5
EDIT
TNR / SC / AUX
VIDEO SEL
SHARPNESS CTL
SHARPNESS MAX
D1
D3
To 02 SWITCHING POWER SUPPLY(2) CN11
CN6
AC ONLINE
GND
D4
FROM 25 POWER SW CN1
CN7
TV/VIDEO
OP 3
TNR / SC / AUX
R2 3.3K
TO 04 MECHACON CN12
CN8
OP 3
OP 2
OP 1
R1 1.5K
TO 10 AUDIO IN/OUT CN12
CN9
PHONES LEVEL
IND SIG (L)
IND SIG (R)
GND
INPUT SEL (TNR)
From/To 25 POWER SWITCH CN201
INPUT SEL (SC) J1
SWD 12V J2
INPUT SEL (TNR) J3
INPUT SEL (TNR) J4
INPUT SEL (SC) J5
GND J6
FROM CONT. P
CN1
CN2
1 VIDEO SEL
2 INPUT SEL (TNR)
3 INPUT SEL (SC)
4 SWD 12V
5 ALC ON/OFF
6 REC LEVEL R(−)
7 REC LEVEL L(−)
8 REC LEVEL R(+)
9 REC LEVEL L(+)
10 TRACKING LEVEL
11 LEVEL METER(L)
12 LEVEL METER(R)
13 PHONES LEVEL
14 IND SIG(L)
15 IND SIG(R)
16 GND
17 AC ONLINE
18 SHARPNESS CTL
19 SHARPNESS MAX
20 EDIT
21 GND
22 TV / VDEO
23 OP 2
24 OP 1
25 V LOCK 1
26 V LOCK 2
R211 2.2K
R212 2.2K
R213 3.3K
R214 4.7K
R215 10K
R216 22K
S201 STOP
S202 PAUSE /STILL
S203 PLAY /X2
S204 REW
S205 FF
S206 VARIABLE SEARCH (REW)
S207 VARIABLE SEARCH (FWD)
R217 2.2K
R218 2.2K
R219 3.3K
R220 4.7K
R221 10K
R222 22K
S208 AUDIO DUB
S209 INSERT
S211 ERASE
S212 TRACKING (−)
S213 MARK
S214 INDEX
R229 4.7K
R227 10K
R228 22K
S222 S-MODE
S220 AUDIO MONITOR
S221 TRACKING (+)
R401 50K V LOCK
HI-FI AUDIO REC LEVEL
R404 (L) 2K
R405 (R) 2K
R403 20K PHONES LEVEL
S407 ALC
OFF ON
R402 10K P. SHARPNESS
S408 AC ONLINE
OFF ON
S405 EDIT
OFF ON
S410 VIDEO IN SELECT
VIDEO S
ON
OFF
HI-FI TRACK
S406 LEVEL INDICATOR
TUNER
SIMUL
AUX
S401 SOURCE SELECT
D401
S1 1/SUN
S2 2/MON
S3 3/TUE
S4 4/WED
S5 5/THU
S6 6/FRI
S7 7/SAT
S8 8/1ST/2ND
S9 9/DAILY
S10 #/REPEAT
S11 GO-TO
S12 ENTER
S13 COUNTER RESET
S14 CH UP
S15 REC/ITR
S16 SP/EP
S17 DISPLAY
S18 CH DOWN
S19 SAP REC
S21 C. ADJ
S22 PROG
S23 TIMER
S24 CANCEL /SKIP
S26 ON SCREEN
S27 AM/PM /SIMUL
S403 AFC
NORM SPCL
D403
S402 C.MEMORY
OFF ON
D402
S409 AUTO TITLE
OFF ON
D409
S404 BAND
TV CATV HRC
D404
CN1
1 KS C
2 KS B
3 KS A
4 KS G
5 KS E
6 KS L 2
7 KS L 1
8 KS L 0
9 KS 3
10 KS 2
11 KS F
12 KS 0
13 KS D
14 KS 1
From 20 TIMER CN9
6
5
4
3
2
1
A
B
C
D
E
F
G
H

3.42 CONTROL AND STEP CIRCUIT BOARDS

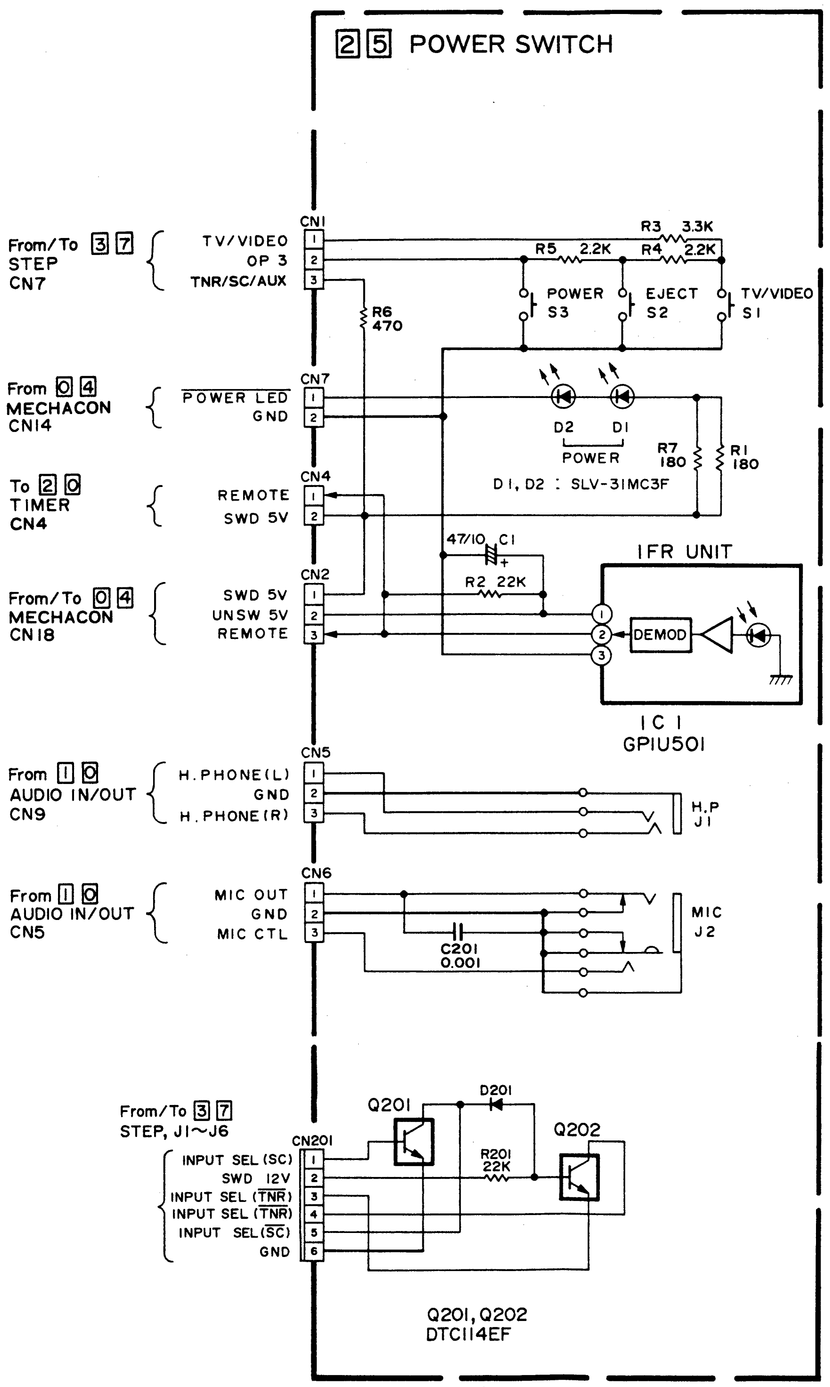
– CONTROL –


CONTROL PWB ASS'Y
PB10107 A
2 4
S3 TUE
S2 MON
S1 SUN
S11 GO-TO
S26 ON SCREEN
S6 FRI
S5 THU
S4 WED
S21 CLOCK ADJUST
S27 AM/PM
S19 SAP REC
S9 DAILY
S8 1ST/2ND
S7 SAT
S24 CANSEL
S12 ENTER
S10 REPEAT
S22 PROG
S16 SP/EP
S23 TIMER
S17 DISPLAY
S13 COUNTER RESET
CHANNEL
S14 +
- S18
D409
REC LEVEL(L) R404
REC LEVEL(R) R405
CONTROL PWB
PB10107
CN1
1
14
R402 P SHARPNESS
R403 HP VOL
R401 V.LOCK
S211 ERASE
S213 MARK
S214 INDEX
S209 INSERT
V.SEARCH
S207
S206
STOP S201
S221
S220 AUDIO MONITOR
TRACKING
S212
R220
R219
R221
R222
R227
R229
R228
R216
R218
R217
AUDIO DUB
S208
S202
PAUSE /STILL
S222 S-MODE
S15 REC/ITR
R215
R214
S205
FF
REW S204
R213
R212
R211
S203
PLAYx2
CN2
26
1
AC ONLINE S408
AUTO TITLE S409
ON OFF
S405
EDIT
S402 C.MEMORY
D402
S403 AFC OFF ON
BAND S404
HRC CATV TV
D404
D403
D401
HIFI TRACK-ING
S406
LEVEL INDICATOR
AUX
SC
TUNER
S401
SOURCE SEL
S407 ALC
S410 V.SEL
S VIDEO

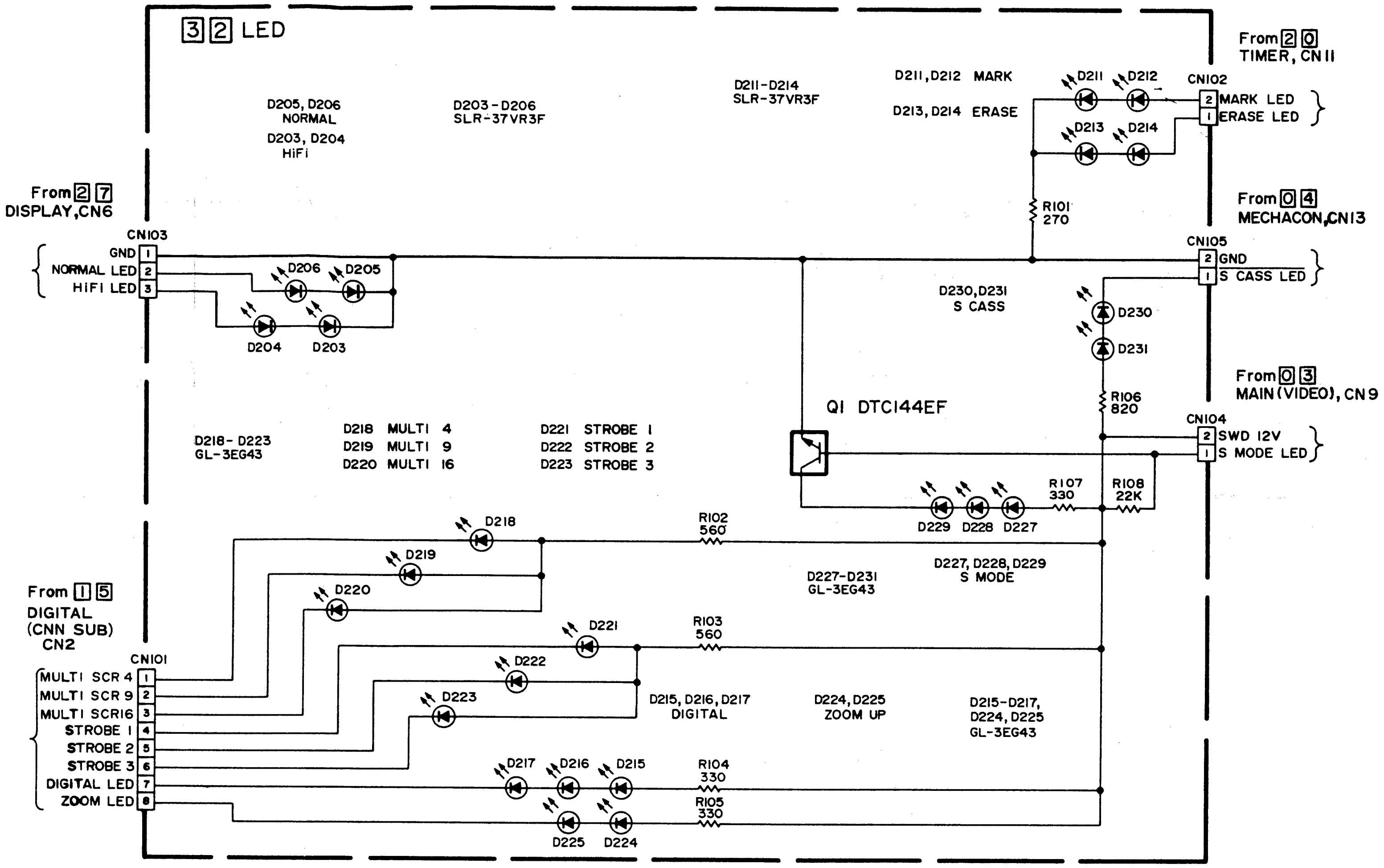
– STEP –


D4
1
5
15
25
CN1
2
10
20
26
CN7
1
3
CN6
CN2
J6
CN8
R1
R3
D2
J1
D3
R2
J3
J5
R4
J2
J4
D1
CN3
7
CN4
4
CN9
5
CN5
3
7
STEP PWB
PB30052
-01-02
PB30052 A-01
STEP PWB ASS'Y

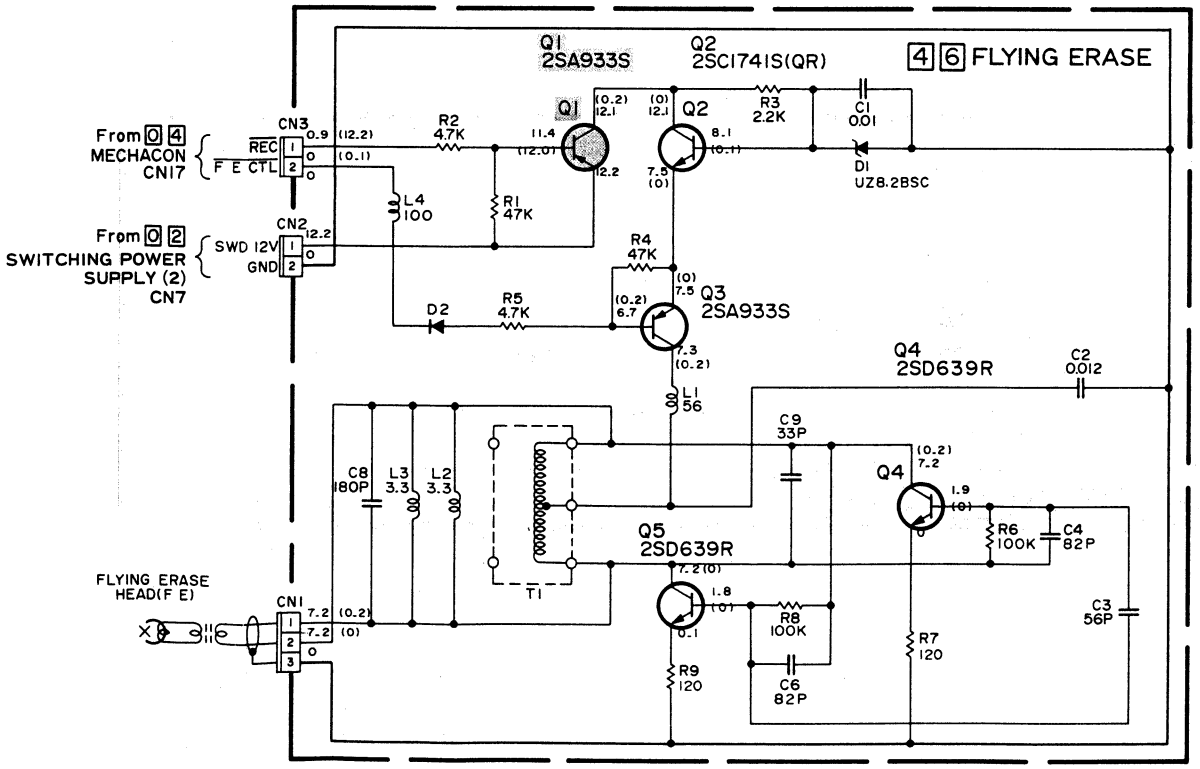
3.43 POWER SWITCH, LED AND FLYING ERASE SCHEMATIC DIAGRAMS



25 POWER SWITCH
From/To 37 STEP CN7
TV/VIDEO
OP 3
TNR/SC/AUX
CN1
R3 3.3K
R5 2.2K
R4 2.2K
R6 470
POWER S3
EJECT S2
TV/VIDEO S1
From 04 MECHACON CN14
POWER LED
GND
CN7
D2 D1
POWER
R7 180
R1 180
D1, D2 : SLV-31MC3F
To 20 TIMER CN4
REMOTE
SWD 5V
CN4
47/10 C1
R2 22K
IFR UNIT
From/To 04 MECHACON CN18
SWD 5V
UNSW 5V
REMOTE
CN2
DEMOD
IC1 GP1U501
From 10 AUDIO IN/OUT CN9
H.PHONE(L)
GND
H.PHONE(R)
CN5
H.P J1
From 10 AUDIO IN/OUT CN5
MIC OUT
GND
MIC CTL
CN6
C201 0.001
MIC J2
From/To 37 STEP, J1~J6
CN201
INPUT SEL (SC)
SWD 12V
INPUT SEL (TNR)
INPUT SEL (TNR)
INPUT SEL (SC)
GND
Q201
D201
R201 22K
Q202
Q201, Q202 DTC114EF



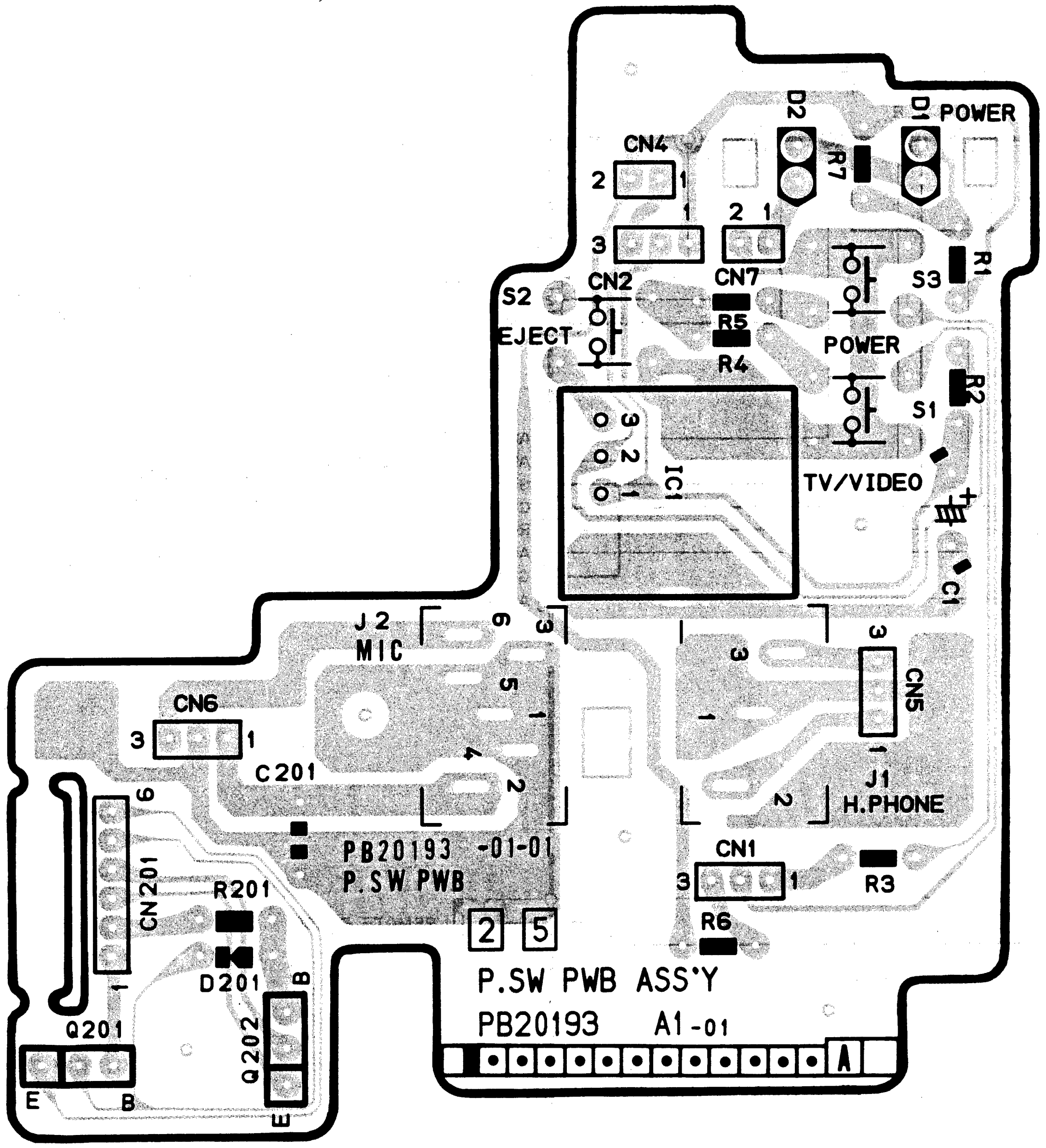
32 LED
D205, D206 NORMAL
D203, D204 HiFi
D203-D206 SLR-37VR3F
D211-D214 SLR-37VR3F
D211, D212 MARK
D213, D214 ERASE
D211 D212 D213 D214
CN102
MARK LED
ERASE LED
From 20 TIMER, CN11
From 27 DISPLAY, CN6
CN103
GND
NORMAL LED
HIFI LED
D206 D205 D204 D203
R101 270
From 04 MECHACON, CN13
CN105
GND
S CASS LED
D230, D231 S CASS
D230 D231
R106 820
From 03 MAIN (VIDEO), CN9
CN104
SWD 12V
S MODE LED
Q1 DTC144EF
D218-D223 GL-3EG43
D218 MULTI 4
D219 MULTI 9
D220 MULTI 16
D221 STROBE 1
D222 STROBE 2
D223 STROBE 3
R107 330
R108 22K
D229 D228 D227
R102 560
D227-D231 GL-3EG43
D227, D228, D229 S MODE
From 15 DIGITAL (CNN SUB) CN2
CN101
MULTI SCR 4
MULTI SCR 9
MULTI SCR16
STROBE 1
STROBE 2
STROBE 3
DIGITAL LED
ZOOM LED
D218 D219 D220 D221 D222 D223
R103 560
D215, D216, D217 DIGITAL
D224, D225 ZOOM UP
D215-D217, D224, D225 GL-3EG43
D217 D216 D215
R104 330
R105 330
D225 D224



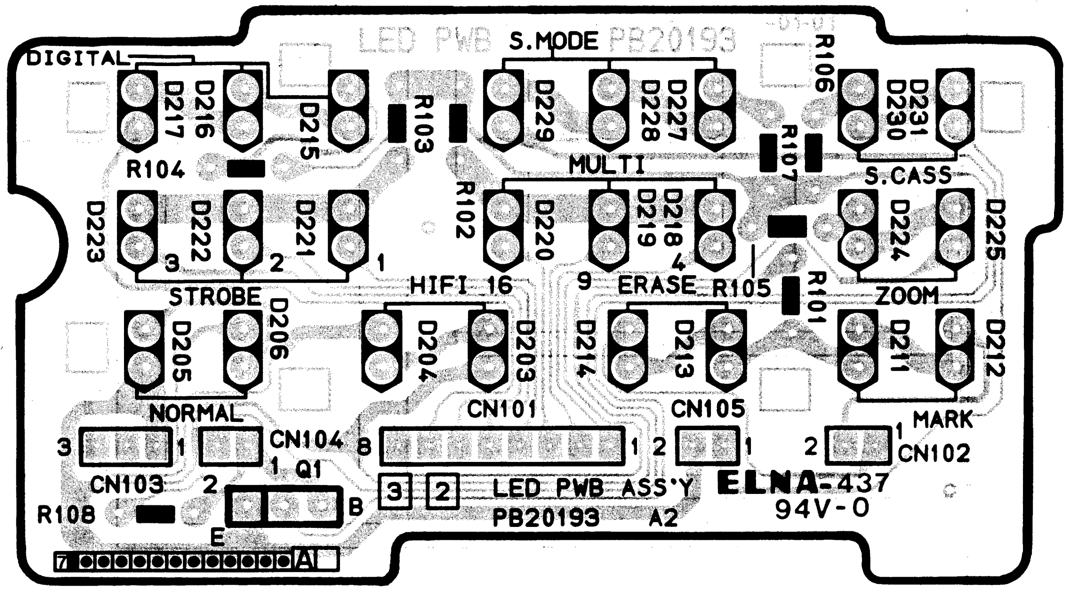
46 FLYING ERASE
Q1 2SA933S
Q2 2SC1741S(QR)
From 04 MECHACON CN17
CN3
REC
F E CTL
0.9 (12.2)
(0.1)
R2 4.7K
11.4 (12.0)
(0.2) 12.1
(0) 12.1
12.2
7.5 (0)
8.1 (0.1)
R3 2.2K
C1 0.01
D1 UZ8.2BSC
From 02 SWITCHING POWER SUPPLY (2) CN7
CN2
SWD 12V
GND
12.2
L4 100
R1 47K
R4 47K
(0) 7.5
Q3 2SA933S
D2
R5 4.7K
(0.2) 6.7
7.3 (0.2)
L1 56
Q4 2SD639R
C2 0.012
C9 33P
(0.2) 7.2
1.9 (0)
C8 180P
L3 3.3
L2 3.3
T1
Q5 2SD639R
7.2 (0)
1.8 (0)
0.1
R8 100K
R6 100K
C4 82P
C3 56P
FLYING ERASE HEAD (F E)
CN1
7.2 (0.2)
7.2 (0)
R9 120
C6 82P
R7 120

3.44 POWER SWITCH , LED AND FLYING ERASE CIRCUIT BOARDS

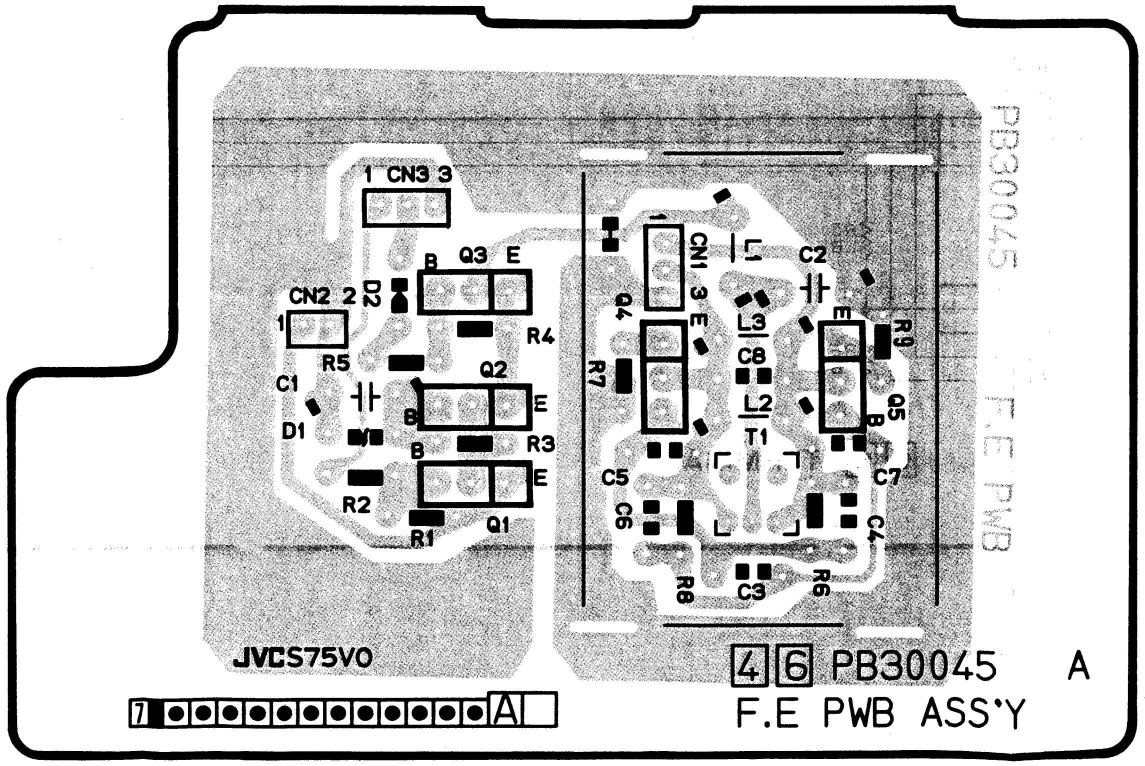
– POWER SWITCH –


CN4
D2
D1
POWER
R7
CN7
CN2
S2
EJECT
R5
R4
S3
R1
POWER
R2
S1
IC1
TV/VIDEO
C1
J2
MIC
CN5
CN6
C201
J1
H.PHONE
CN201
R201
D201
PB20193 -01-01
P.SW PWB
CN1
R3
R6
2 5
P.SW PWB ASS'Y
PB20193 A1-01
Q201
Q202
E
B
A

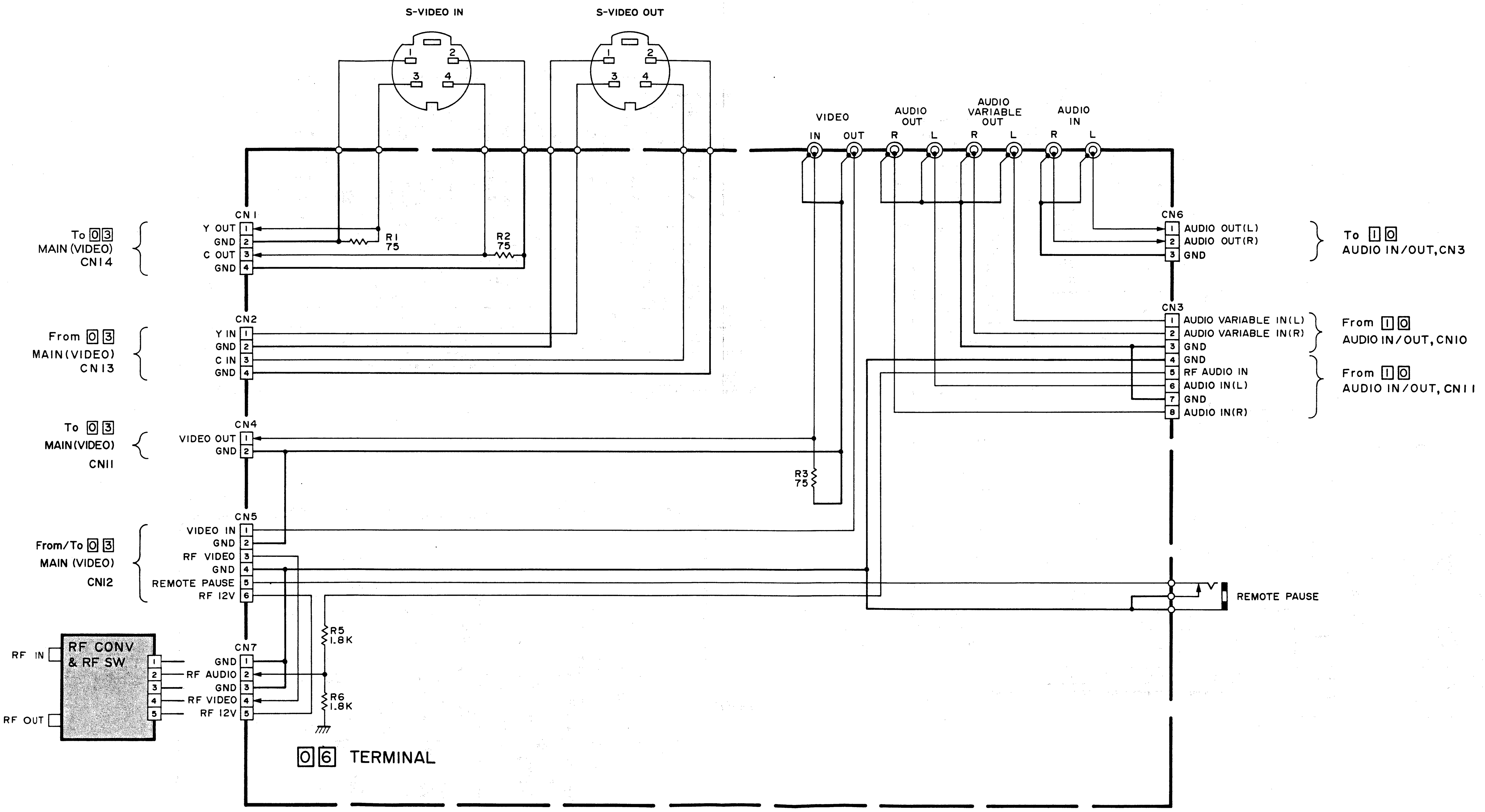
– LED –


DIGITAL
LED PWB
S.MODE
PB20193
R106
D217
D216
D215
R103
D229
D228
D227
D231
D230
R104
MULTI
R107
S.CASS
D223
D222
D221
R102
D220
D219
D218
D224
D225
STROBE
HIFI 16
ERASE
R105
R101
ZOOM
D205
D206
D204
D203
D214
D213
D211
D212
NORMAL
CN101
CN105
MARK
CN103
CN104
Q1
CN102
R108
3 2
LED PWB ASS'Y
PB20193 A2
ELNA-437
94V-0
E
B
A

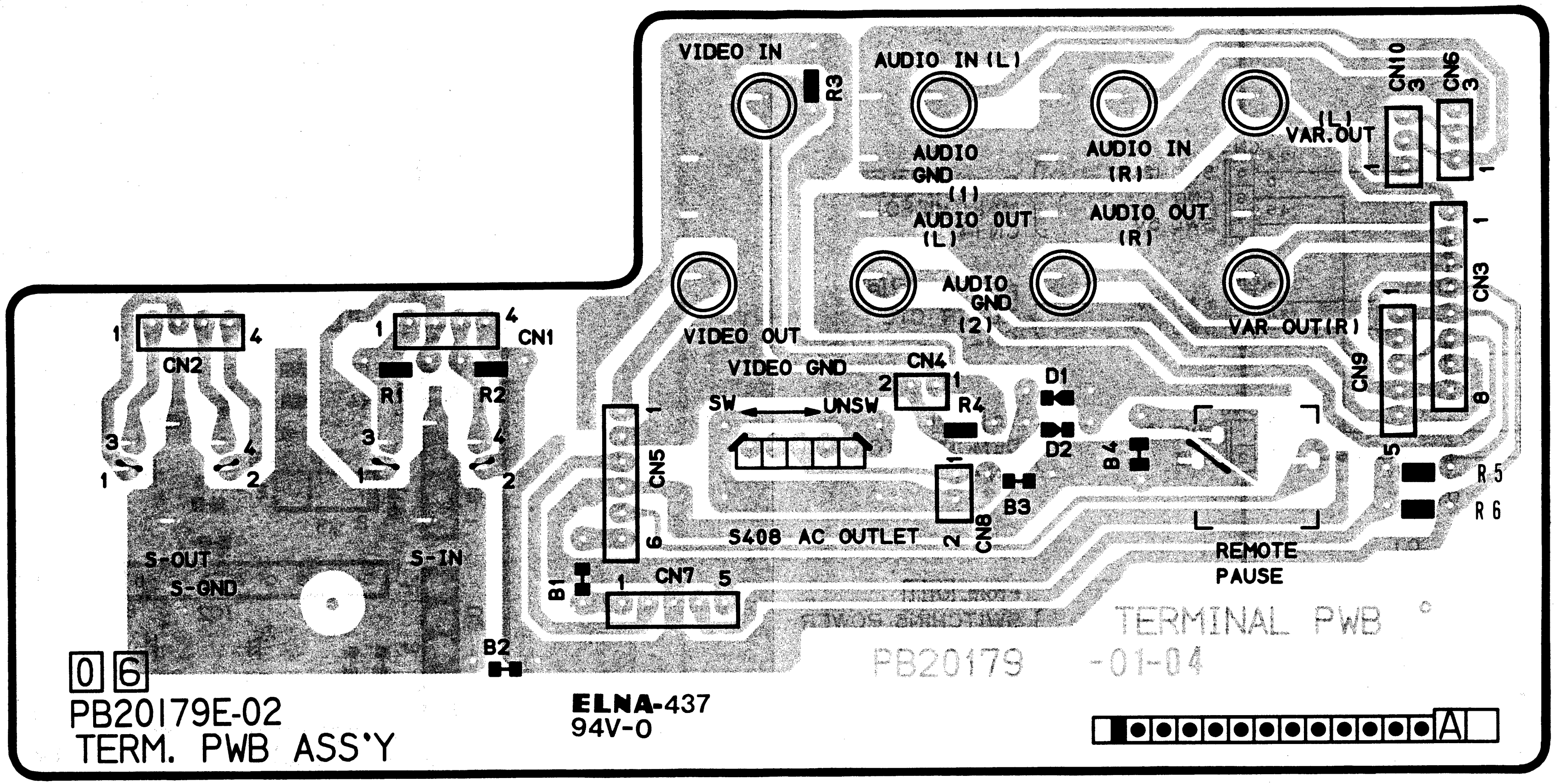
– FLYING ERASE –


PB30045
CN3
CN1
C2
L1
Q3
D2
CN2
R4
Q4
L3
R9
R5
Q2
R7
C8
C1
L2
Q5
D1
R3
T1
C5
C7
R2
C6
C4
R1
Q1
R8
C3
R6
F.E PWB
JVCS75V0
4 6 PB30045 A
F.E PWB ASS'Y
A
B
E

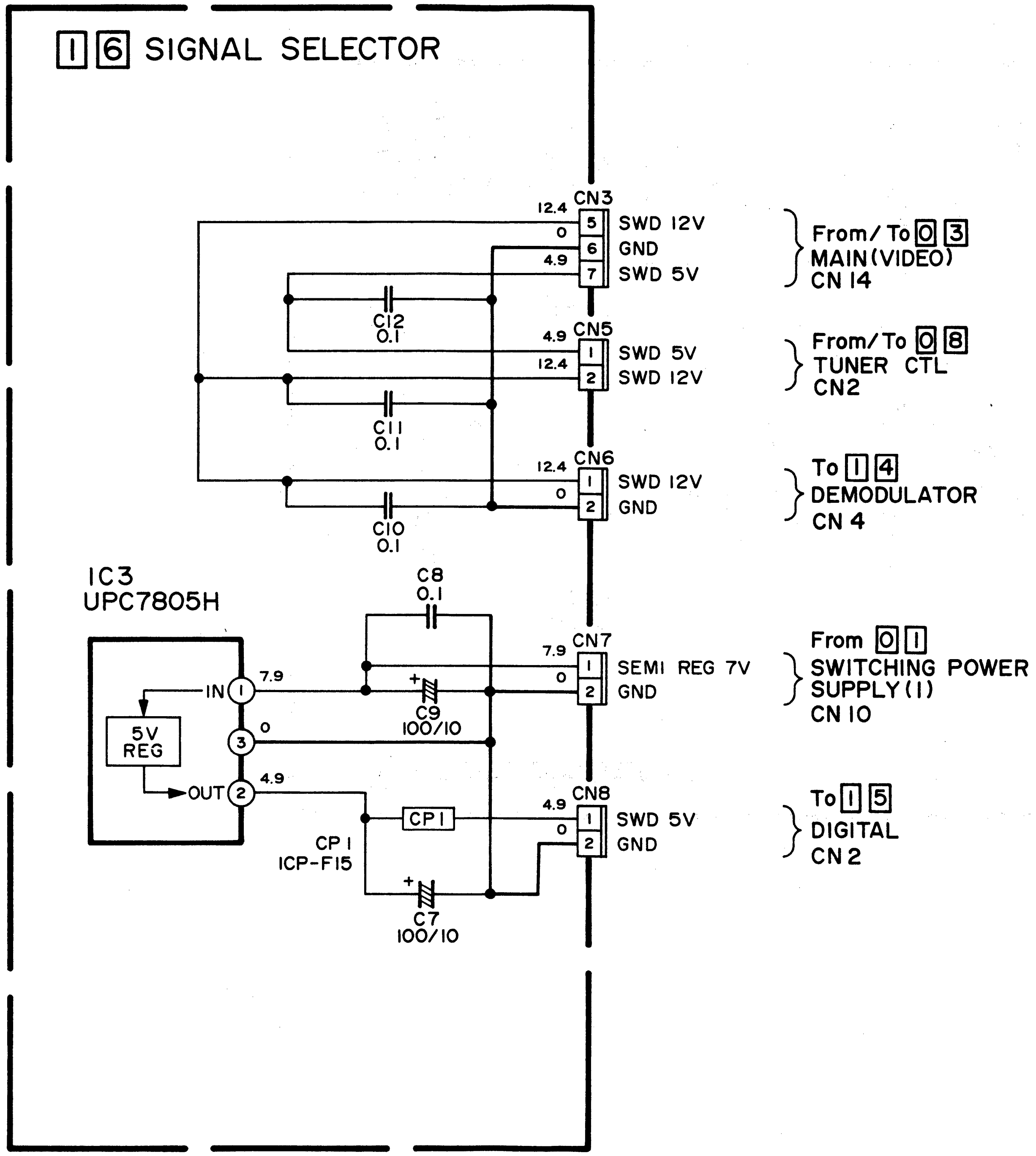
3.45 TERMINAL SCHEMATIC DIAGRAM


S-VIDEO IN
S-VIDEO OUT
1
2
3
4
VIDEO
IN
OUT
AUDIO
OUT
R
L
AUDIO
VARIABLE
OUT
R
L
AUDIO
IN
R
L
To 03
MAIN (VIDEO)
CN14
CN1
Y OUT 1
GND 2
C OUT 3
GND 4
R1
75
R2
75
From 03
MAIN (VIDEO)
CN13
CN2
Y IN 1
GND 2
C IN 3
GND 4
To 03
MAIN (VIDEO)
CN11
CN4
VIDEO OUT 1
GND 2
R3
75
From/To 03
MAIN (VIDEO)
CN12
CN5
VIDEO IN 1
GND 2
RF VIDEO 3
GND 4
REMOTE PAUSE 5
RF 12V 6
RF IN
RF OUT
RF CONV
& RF SW
1
2
3
4
5
CN7
GND 1
RF AUDIO 2
GND 3
RF VIDEO 4
RF 12V 5
R5
1.8K
R6
1.8K
06 TERMINAL
CN6
1 AUDIO OUT(L)
2 AUDIO OUT(R)
3 GND
To 10
AUDIO IN/OUT, CN3
CN3
1 AUDIO VARIABLE IN(L)
2 AUDIO VARIABLE IN(R)
3 GND
4 GND
5 RF AUDIO IN
6 AUDIO IN(L)
7 GND
8 AUDIO IN(R)
From 10
AUDIO IN/OUT, CN10
From 10
AUDIO IN/OUT, CN11
REMOTE PAUSE

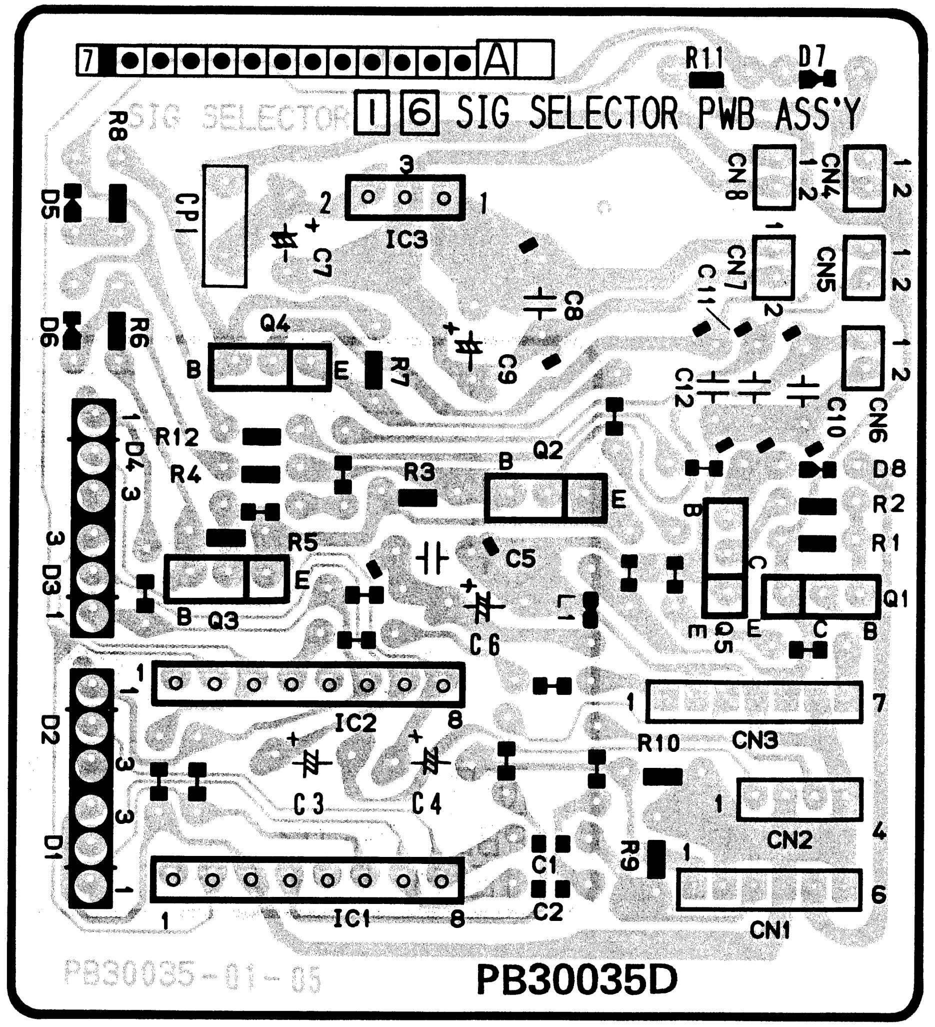
3.46 TERMINAL CIRCUIT BOARD


VIDEO IN
R3
AUDIO IN (L)
AUDIO GND (1)
AUDIO IN (R)
(L) VAR.OUT
CN10
CN6
3
1
AUDIO OUT (L)
AUDIO OUT (R)
CN3
1
8
AUDIO GND (2)
VIDEO OUT
VAR OUT (R)
VIDEO GND
CN9
1
5
CN4
2
1
R4
D1
D2
B4
SW
UNSW
CN5
1
6
CN8
1
2
B3
S408 AC OUTLET
R5
R6
REMOTE PAUSE
CN2
1
4
3
2
CN1
R1
R2
S-OUT
S-GND
S-IN
B1
CN7
1
5
B2
06
PB20179E-02
TERM. PWB ASS'Y
ELNA-437
94V-0
TERMINAL PWB
PB20179 -01-04
A
6
5
4
3
2
1
A
B
C
E
F
G
H

3.47 SIGNAL SELECTOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD



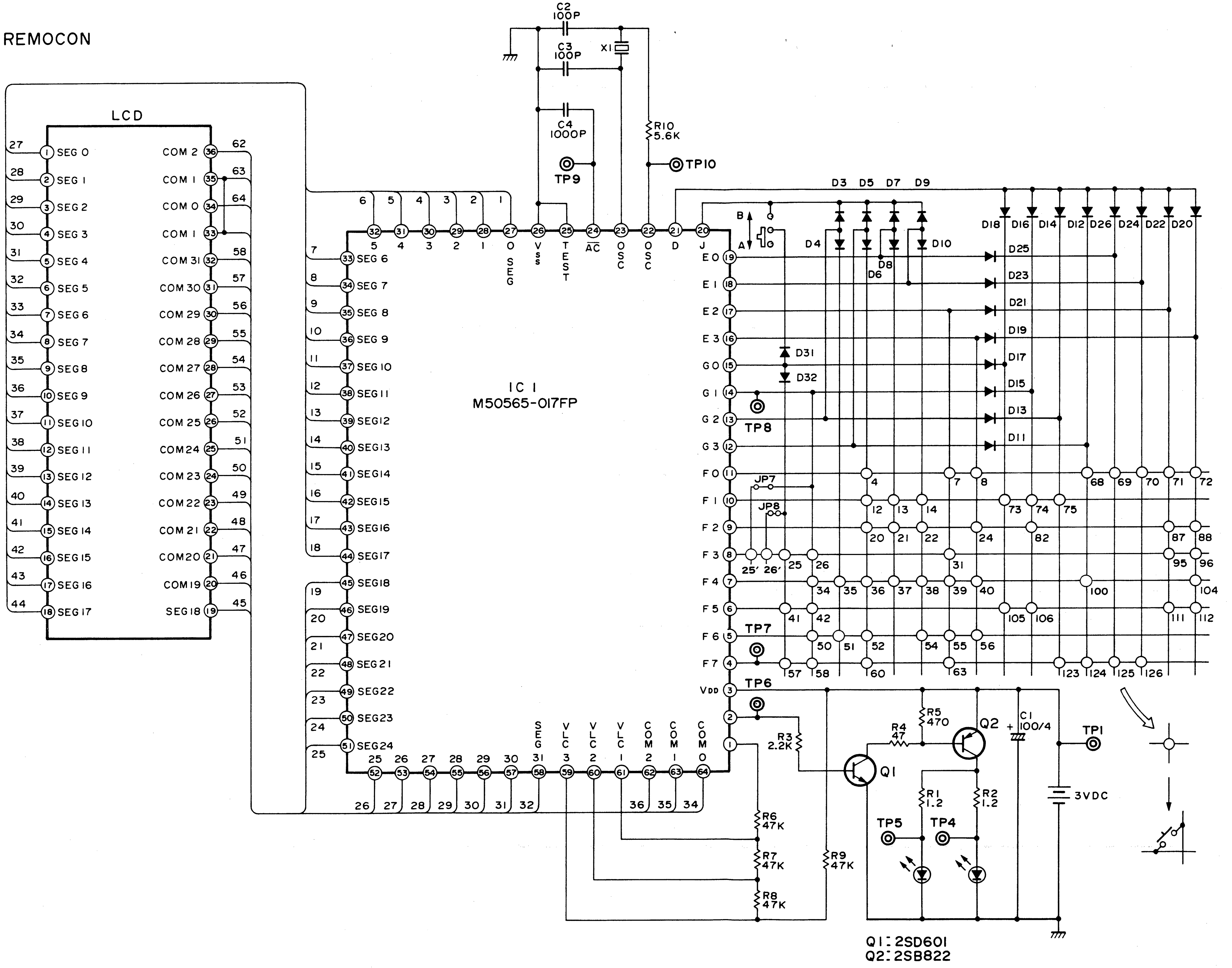
16 SIGNAL SELECTOR
CN3
12.4
0
4.9
5 SWD 12V
6 GND
7 SWD 5V
From/To 03 MAIN(VIDEO) CN 14
C12 0.1
CN5
4.9
12.4
1 SWD 5V
2 SWD 12V
From/To 08 TUNER CTL CN2
C11 0.1
CN6
12.4
0
1 SWD 12V
2 GND
To 14 DEMODULATOR CN 4
C10 0.1
IC3 UPC7805H
C8 0.1
IN 1
7.9
5V REG
3
0
OUT 2
4.9
C9 100/10
CN7
7.9
0
1 SEMI REG 7V
2 GND
From 01 SWITCHING POWER SUPPLY(1) CN 10
CP1
CP 1 ICP-F15
C7 100/10
CN8
4.9
0
1 SWD 5V
2 GND
To 15 DIGITAL CN 2



7
A
R11
D7
SIG SELECTOR
16 SIG SELECTOR PWB ASS'Y
R8
D5
CP1
IC3
3
2
1
C7
CN8
CN4
CN7
CN5
CN6
C8
C9
C11
C12
C10
D6
R6
Q4
B
E
R7
R12
R4
R3
Q2
D8
R2
R1
Q1
D4
D3
R5
Q3
C5
C6
L1
Q5
C
IC2
8
D2
D1
C3
C4
R10
CN3
CN2
R9
C1
C2
IC1
CN1
PB30035-01-05
PB30035D

3.48 REMOTE CONTROL SCHEMATIC DIAGRAM

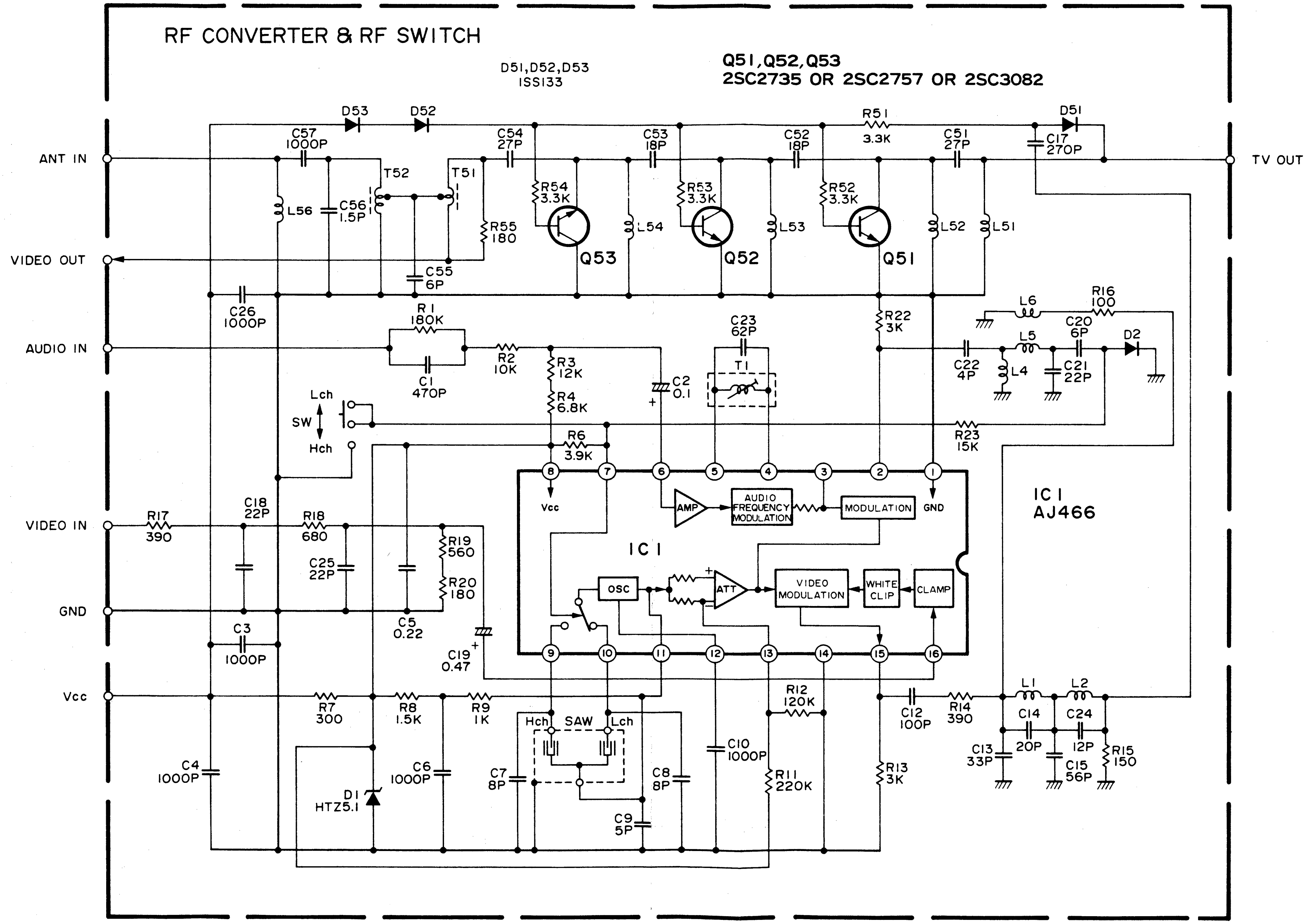
NOTE:
All parts shown in this schematic are critical for safety.
Replace only with specified part numbers.


REMOCON
LCD
SEG 0
SEG 1
SEG 2
SEG 3
SEG 4
SEG 5
SEG 6
SEG 7
SEG 8
SEG 9
SEG 10
SEG 11
SEG 12
SEG 13
SEG 14
SEG 15
SEG 16
SEG 17
COM 2
COM 1
COM 0
COM 1
COM 31
COM 30
COM 29
COM 28
COM 27
COM 26
COM 25
COM 24
COM 23
COM 22
COM 21
COM 20
COM 19
SEG 18
C2 100P
C3 100P
C4 1000P
X1
R10 5.6K
TP9
TP10
IC 1
M50565-017FP
SEG
Vss
TEST
AC
OSC
OSC
D
J
E0
E1
E2
E3
G0
G1
G2
G3
F0
F1
F2
F3
F4
F5
F6
F7
VDD
VLC3
VLC2
VLC1
COM2
COM1
COM0
SEG31
D3 D5 D7 D9
D4
D6
D8
D10
D31
D32
D18 D16 D14 D12 D26 D24 D22 D20
D25
D23
D21
D19
D17
D15
D13
D11
A
B
JP7
JP8
TP8
TP7
TP6
TP5
TP4
TP1
R3 2.2K
R4 47
R5 470
R1 1.2
R2 1.2
R6 47K
R7 47K
R8 47K
R9 47K
C1 100/4
Q1
Q2
3VDC
Q1: 2SD601
Q2: 2SB822

126	MEMORY TRANS
125	MEMORY CANCEL
124	MEMORY PROG.
123	● REC
112	TV VOL (−)
111	TV VOL (+)
109	
106	TV CH
105	TV CH
104	TV POWER
100	TV/VIDEO MONITOR
96	VCR VOL(−)
95	VCR VOL(+)
88	INTRO
87	SKIP SEARCH
83	
82	INDEX
75	MULTI SCREEN
74	SWAP
73	TWIN PICTURE
72	STROBE SPEED
71	ZOOM-UP
70	ART
69	DIGITAL MEMORY
68	OFF
63	ENTER
60	GOTO
58	COUNTER RESET
57	DISPLAY
56	VCR PROG.
55	VCR CANCEL
54	TIMER
53	
52	0/REPEAT
51	AM/PM SIMUL
50	SP/EP
42	9/DAILY
41	8/1ST/2ND
40	7/SAT
39	6/FRI
38	5/THU
37	4/WED
36	3/TUE
35	2/MON
34	1/SUN
31	ON SCREEN
26′	CURSOR BACK
25′	CURSOR NEXT
26	VCR CH ∨
25	VCR CH ∧
24	AUDIO MONITOR
22	<< (VARIABLE SEARCH)
21	>> (VARIABLE SEARCH)
20	TV/VIDEO
14	▮▮ (PAUSE/STILL)
13	▶ PLAY
12	VIDEO POWER(VCR)
8	◀◀ (REW)
7	▶▶ (FF)
4	■ (STOP)
2	
No.	KEY NAME

3.49 RF CONVERTER AND RF SWITCH SCHEMATIC DIAGRAM

NOTES: 1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


RF CONVERTER & RF SWITCH
D51,D52,D53
ISS133
Q51,Q52,Q53
2SC2735 OR 2SC2757 OR 2SC3082
ANT IN
VIDEO OUT
AUDIO IN
VIDEO IN
GND
Vcc
TV OUT
D53
D52
D51
C57 1000P
C54 27P
C53 18P
C52 18P
R51 3.3K
C51 27P
C17 270P
T52
T51
L56
C56 1.5P
R55 180
R54 3.3K
R53 3.3K
R52 3.3K
Q53
Q52
Q51
L54
L53
L52
L51
C55 6P
C26 1000P
R1 180K
C1 470P
R2 10K
R3 12K
R4 6.8K
C2 0.1
C23 62P
T1
R22 3K
L6
R16 100
C20 6P
D2
L5
C22 4P
L4
C21 22P
Lch
SW
Hch
R6 3.9K
R23 15K
Vcc
GND
AMP
AUDIO FREQUENCY MODULATION
MODULATION
IC1
OSC
ATT
VIDEO MODULATION
WHITE CLIP
CLAMP
IC1 AJ466
R17 390
C18 22P
R18 680
C25 22P
R19 560
R20 180
C5 0.22
C3 1000P
C19 0.47
R7 300
R8 1.5K
R9 1K
R12 120K
C12 100P
R14 390
L1
L2
C14 20P
C24 12P
C13 33P
C15 56P
R15 150
C4 1000P
C6 1000P
D1 HTZ5.1
C7 8P
Hch
SAW
Lch
C8 8P
C9 5P
C10 1000P
R11 220K
R13 3K

SECTION 4
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

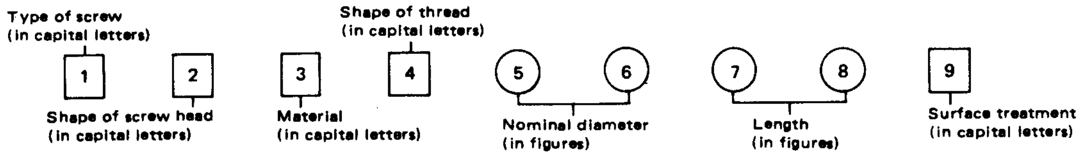
NOTE:

[M] indicates mechanical symbol number.

4.1 STANDARD PART NUMBER CODING

4.1.1 Screw coding

Standard screw part numbers are as follows.

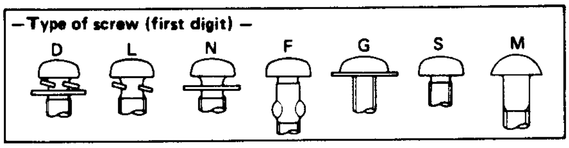

Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

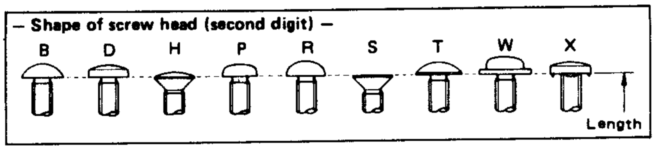
Type of screw (first digit)

S	Normal screws
D	Assembled machine screws (with plain and spring washers)
L	" (with spring washer)
N	" (with plain washer)
F	Feather screws
G	Washer head tapping screws
M	Wood screws

Shape of screw head (second digit)

B	Brazier head
D	Binding head
H	Oval countersunk head
P	Pan head
R	Round head
S	Flat head
T	Truss head
W	Washer head (machine screws)
X	Toothed head


—Type of screw (first digit) —

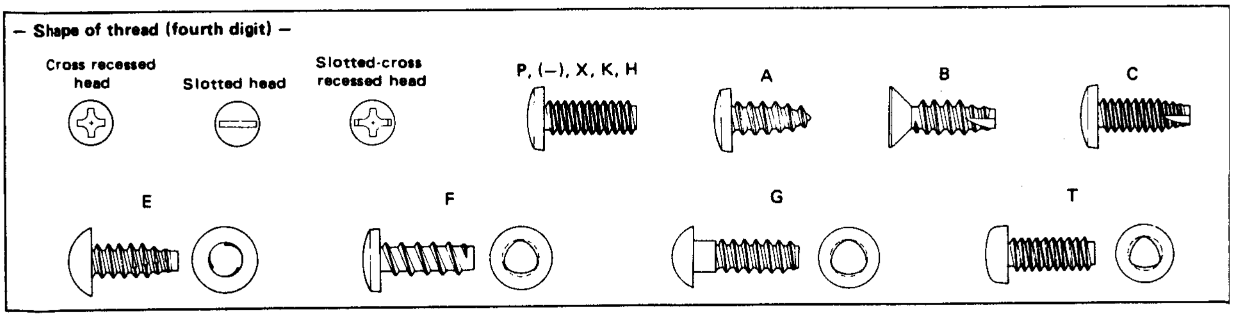

— Shape of screw head (second digit) —
B
D
H
P
R
S
T
W
X
Length

Material (third digit)

S	Steel
E	Stainless steel
C	Cast iron
U	Copper
B	Brass
P	Phosphor bronze
N	Nickel silver
Y	Cast brass
A	Aluminum
Z	Zinc alloy
K	Polycarbonate

Shape of thread (fourth digit)

P	Cross recessed head screws
(–)	Slotted head machine screws
X	Slotted-cross recessed head machine screws
K	Cross recessed head machine screws for precision equipment (type 1)
H	" (type 3)
A	Cross recessed head tapping screws (type 1)
B	" (type 2)
C	" (type 3)
E	Cross recessed head special tapping screws (brand : evertight)
F	" (brand : P-tight)
T	" (brand : taptight)
G	"


— Shape of thread (fourth digit) —
Cross recessed head
Slotted head
Slotted-cross recessed head
P, (–), X, K, H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

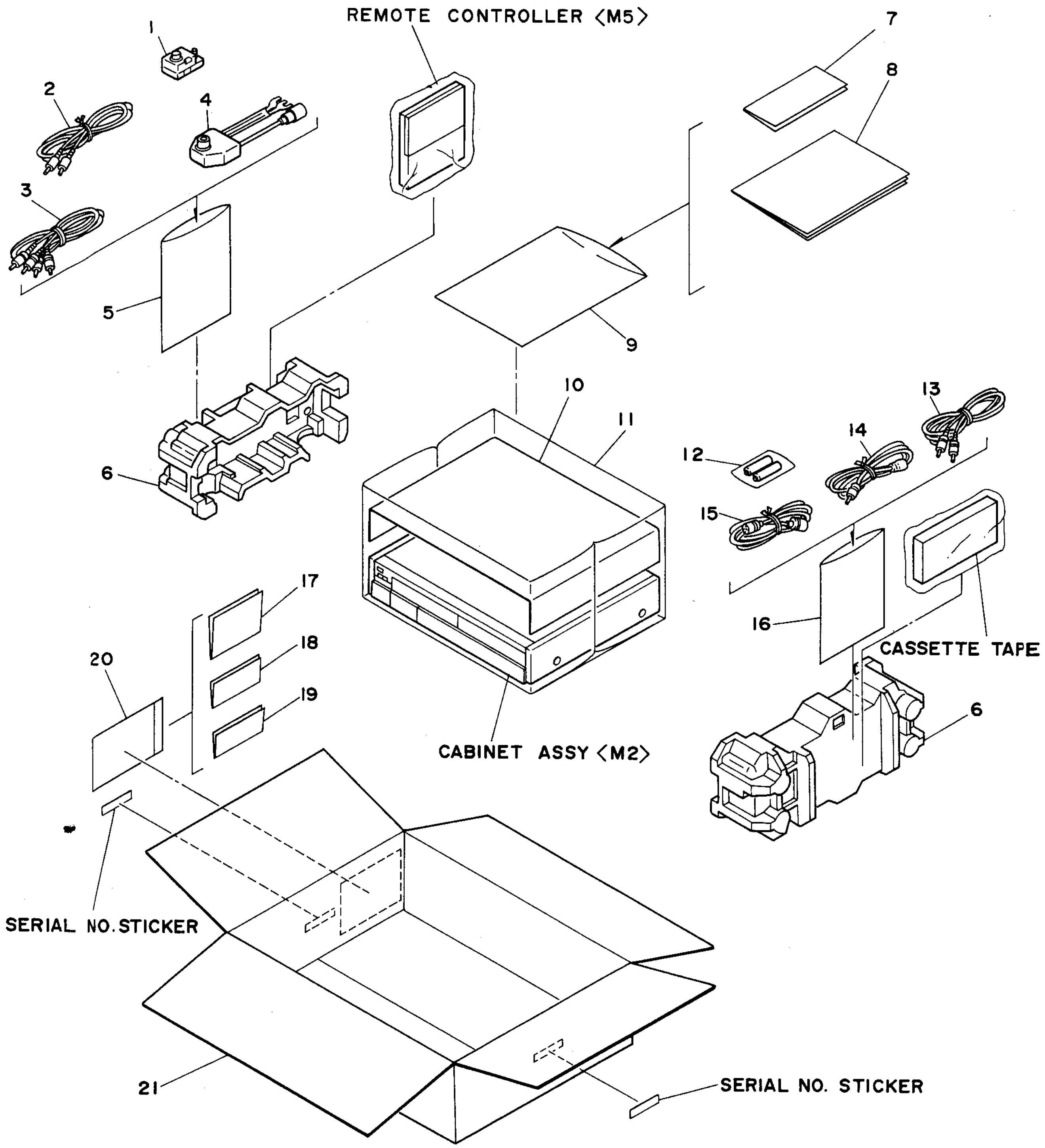
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

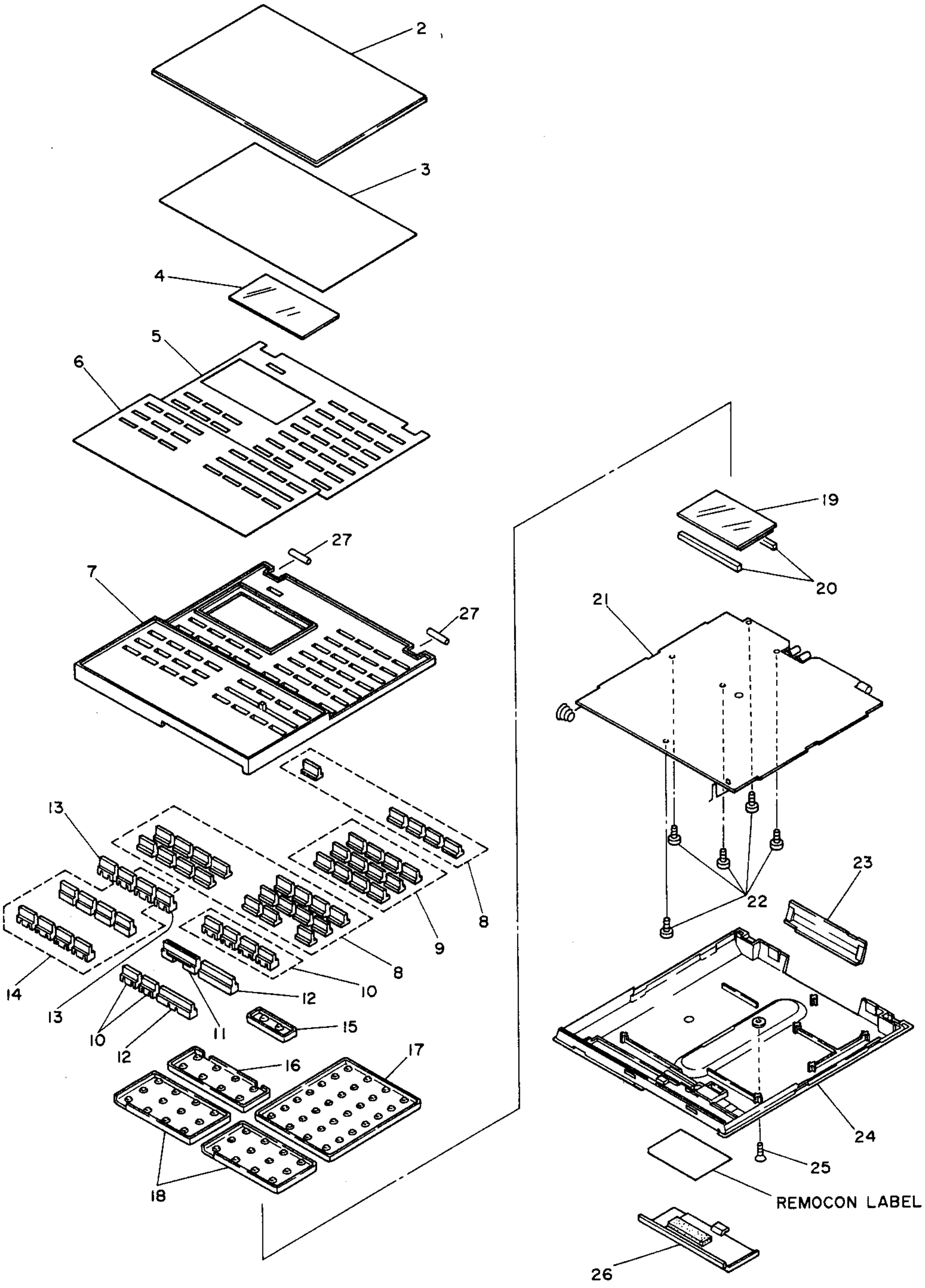
Z	Dichromate treatment after galvanizing (MFZn II-C)
N	Nickel plating (MFNi II, MFNi I)
R	Chromium plating (MBCr II, MBCr I)
G	Silver plating (SP4)
B	Black coating after plating
F	Blackening of iron (FB)
M	Blackening after galvanizing
K	Pickling of brass (PF2)
P	Phosphate treatment
W	Uni-chrome plating
L	Coated with transparent paint
A	Colored red after galvanizing (MFZn II-C)
C	Colored blue after galvanizing (MFZn II-C)
T	Colored green after galvanizing (MFZn II-C)
V	Colored purple after galvanizing (MFZn II-C)

4.5 PACKING ASSEMBLY < M1 >


REMOTE CONTROLLER <M5>
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
CASSETTE TAPE
6
CABINET ASSY <M2>
SERIAL NO.STICKER
SERIAL NO. STICKER

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
			1. PACKING ASSEMBLY <M1>
⚠	1	PU35613-2	MATCHING TRANSFORMER
⚠	OR	PU59135-2	MATCHING TRANSFORMER
	2	PU60111	DIN CABLE
	3	PU56142-3	PIN CORD ASSY
⚠	4	PU59610-2	ANTENNA SPLITTER
	5	QPGA020-02003	POLY BAG
	6	PQ32215B	CUSHION ASSY
⚠	7	PU33941-3-2	SAFETY CAUTION
⚠	8	PU30425-963	INSTRUCTIONS,CANADA
⚠		PU30425-962	INSTRUCTIONS, U. S. A.
	9	QPGA025-03505	POLY BAG
	10	PU57777-6	WADDING PAPER
	11	PQM30021-70	POLY BAG
	12	UM-3DJ2P	BATTERY, X2
	13	PU59205-3	PIN JACK CABLE
⚠	14	PU59167-4	RF CABLE
⚠	15	PU59167-2	RF CABLE
⚠	OR	PU59168-2	RF CABLE
	16	QPGA020-02003	POLY BAG
	17	BT-20025J	WARRANTY CARD,CANADA
		BT-20062	WARRANTY CARD, U. S. A.
	18	BT-20046C	TOLL FREE CARD, U. S. A.
	19	BT-20071A	INSTRUCTION GUIDE,CANADA
	20	PU54821	POLY BAG
	21	PQ32389-2	PACKING CASE,CANADA
		PQ32389	PACKING CASE, U. S. A.

4.6 REMOTE CONTROL UNIT < M5 >



```
*****************************************************
*     5. REMOTE CONTROL UNIT <M5>                   *
*****************************************************
```

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	PQ10607B	REMOTE CONTROLLER, INCL. 2–27
	2	PQ32134-2	DOOR
	3	PU36437-2	INST LABEL
	4	PQ43244	LCD WINDOW
	5	PQ32135-2	10 KEY PLATE
	6	PQ32136-2	OPERATION PLATE
	7	PQ32131	UPPER CASE
	8	PQ10607-5	BUTTON (BLACK), X24
	9	PQ10607-6	BUTTON (GRAY), X12
	10	PQ10607-7	BUTTON (GRAY), X6
	11	PQ10607-8	BUTTON (GRAY/RED)
	12	PQ10607-9	BUTTON (GRAY), X2
	13	PQ10607-10	BUTTON (BLUE), X2
	14	PQ10607-11	BUTTON (BLACK), X10
	15	PQ10607-12	RUBBER SHEET (D)
	16	PQ10607-13	RUBBER SHEET (C)
	17	PQ10607-14	RUBBER SHEET (A)
	18	PQ10607-15	RUBBER SHEET (B), X2
	19	PQ10607-18	LCD
	20	PQ10543-015	CONNECTOR, X2
	21	–	REMOCON BOARD ASSY, REF. <RM>
	22	SDST2005Z	TAPPING SCREW, X5
	23	PQ10607-19	WINDOW
	24	PQ32132	LOWER CASE
	25	SSSP2006B	SCREW
	26	PQ32133	BATTERY CAP
	27	PQ10607-20	SPRING PIN, X2

SECTION 5

ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS– All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS–All capacitance values are in μF, unless otherwise indicated.

pF	: μμF (Pico farad)
C Cap	: Caramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

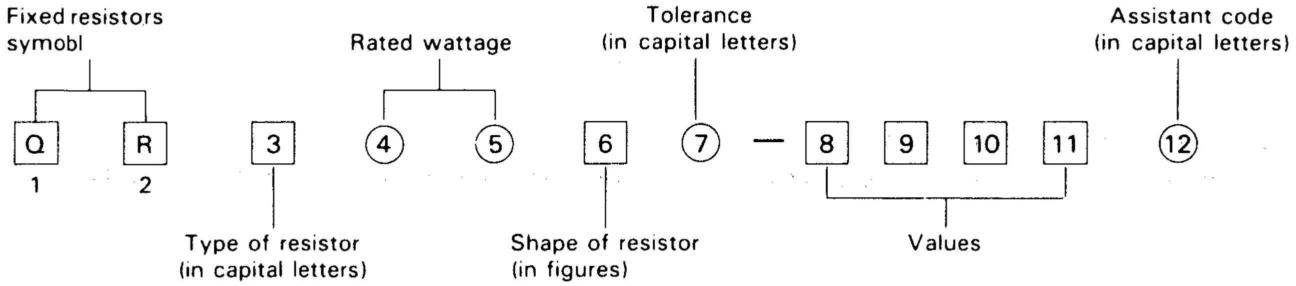
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

5.1 STANDARD PART NUMBER CODING

5.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symobl
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
Q
R
1
2
3
④
⑤
6
⑦
—
8
9
10
11
⑫
Type of resistor (in capital letters)
Shape of resistor (in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage (fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance (seventh digit)

F	± 1 %
G	± 2 %
J	± 5 %
K	± 10 %
M	± 20 %

Assistant code (twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead taping
Z	Lead taping

Values (eighth – tenth or eleventh digits)

examples:

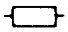
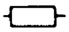
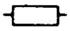
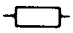
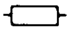
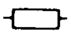
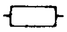
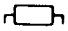
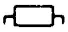
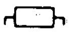
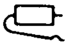
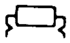
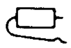
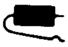
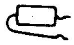
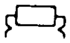
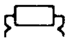
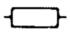
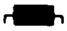
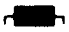
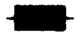
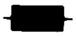
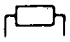
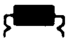
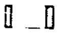
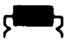
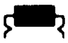
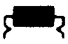
R47		0.47 Ω
4R7		4.7 Ω
470	47×10^{0}	47 Ω
471	47×10^{1}	470 Ω
472	47×10^{2}	4.7 kΩ
473	47×10^{3}	47 kΩ
474	47×10^{4}	470 kΩ
475	47×10^{5}	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^{0}	464 Ω
4641	464×10^{1}	4.64 kΩ
4642	464×10^{2}	46.4 kΩ

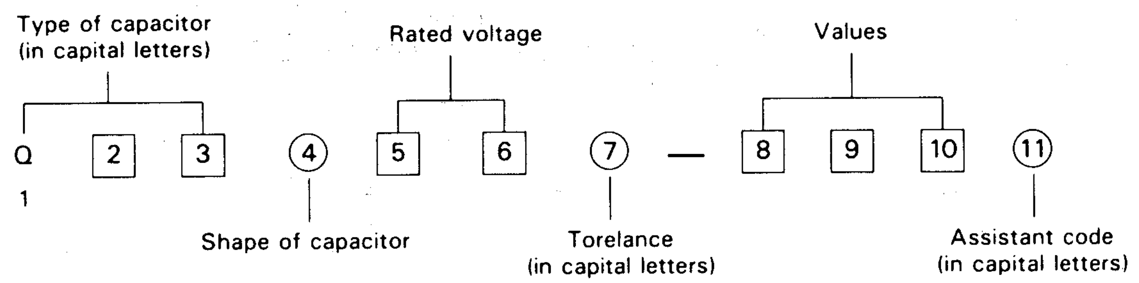
Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

Shape of resistor \ Type of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

5.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
Values
Q
1
2
3
④
5
6
⑦
—
8
9
10
⑪
Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	±5 %	X	$^{+40}_{-20}$ %
K	±10 %	Z	$^{+80}_{-20}$ %

Values (eighth — tenth digits)

Example : Values are in picofarads

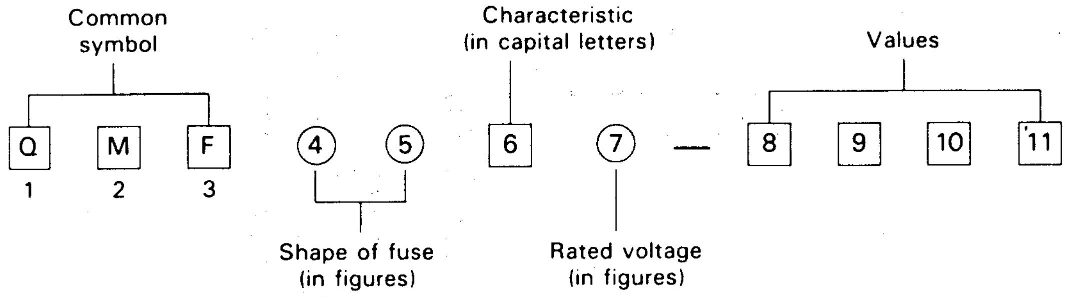
101 ....10×10^1 pF............. 100 pF
102 ....10×10^2 pF............. 1,000 pF (0.001 μF)
103 ....10×10^3 pF............. 10,000 pF (0.01 μF)
104 ....10×10^4 pF............. 100,000 pF (0.1 μF)
105 ....10×10^5 pF............. 1 μF
5R0 .... 5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead taping
Y	Lead taping

5.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common symbol
Characteristic (in capital letters)
Values
Q
M
F
1
2
3
④
⑤
6
⑦
—
8
9
10
11
Shape of fuse (in figures)
Rated voltage (in figures)

Shape of fuse
(fourth and fifth digits)

51	ϕ5.2×20 mm
60	ϕ6.4×30 mm
61	ϕ6.35×31.8 mm
63	ϕ6.4×30 mm with lead wires
66	ϕ6.35×31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V
3	0.1−1 A : AC250 V 1.25−6.3 A : AC125 V

Values
(eighth-tenth or eleventh digits)
example:
R63 .... 0.63 A
1R0 .... 1.0 A
2R5 .... 2.5 A
100 .... 10 A
R315 .... 0.315 A
1R25 .... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

6. SWITCHING POWER SUPPLY B.AY <01><02>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB10078E-01	S.P.S.BOARD ASS'Y
⚠	POC1	QMP14B0-200	POWER CORD
⚠	OR	QMP14B0-200E	POWER CORD
⚠	A01	QMC0242-007	AC OUTLET
	BKT1	PQ20531-3	TRANS BRACKET
	CL1	PU55379	MINI CLAMP
⚠	HD1	QHS3771-108	STRAIN RELIEF
	HS2	PQ43230	HEAT SINK(2)
	SCW1	DPSP3010Z	SCREW,X2
	SCW2	SDST3006Z	SCREW,X3
	SCW3	DPSP4008Z	SCREW,X2
	SLD1	PQ32179	SHILD CASE(2)
	SLD2	PQ32180	SHILD CASE(3)
⚠	SLD3	PQ32075-2-2	COVER (1)

-SWITCHING POWER TRANSFORMER B.AY <01>-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA1	PB10078E1-01	S.P.S.(1) BOARD ASS'Y
⚠	IC1	STR15006	IC
	Q1	DTD114ES	TRANSISTOR
	D1	10E4	DIODE
	D2	10E4	DIODE
	D3	10E4	DIODE
	D4	10E4	DIODE
	D5	RU1A	FR DIODE
	D6	AU01Z	FR DIODE
	D8	EK04	FR DIODE
	D9	RU1A	FR DIODE
	D10	FML-12S	FR DIODE
	OR	F6P20F	FR DIODE
	D13	FMB-24	SBD
	OR	F5KQ40B	SBD
	D15	MA165	DIODE
	OR	1SS133	DIODE
	R1	QRZ0078-1R0	WW RESISTOR
	R2	QRD181J-154	RESISTOR
	R3	QRD181J-154	RESISTOR
	R4	QRG029J-683	O.M.F RESISTOR
	R5	QRD181J-334	RESISTOR
	R6	QRG029J-181G	OMF RESISTOR
	R7	QRZ0078-R33	WW RESISTOR
⚠	R8	QRC122K-225E	RESISTOR
	R9	QRG029J-361A	OMF RESISTOR
	R100	QVZ3507-101	V RESISTOR,SEMIREG 15V ADJ
⚠	C1	QCZ9016-103P	CAPACITOR
⚠	C2	QFZ9025-333	M M CAP
⚠	C3	QCZ9016-222M	CAPACITOR
⚠	C4	QCZ9016-222M	CAPACITOR
⚠	C5	QCZ9016-102K	CAPACITOR
⚠	C10	QEZ0126-157	E CAPACITOR
	C11	QCY53AK-472	CAPACITOR
	C12	QCY43AK-121	CAPACITOR
	C13	QFL41HJ-222	M CAPACITOR
	C14	QFV41HJ-474	M CAPACITOR
	C15	QEZ0108-187Z	E CAPACITOR
⚠	C20	QEZ0125-338	E CAPACITOR
	C21	QETB1CM-108	E CAPACITOR
	C22	QETB1CM-108	E CAPACITOR
	C23	QEZ0106-478	E CAPACITOR
	C24	QETA1AM-108	E CAPACITOR
	C25	QFV41HJ-103	M CAPACITOR
⚠	L2	PU60401	LINE FILTER
	L10	PU56181-330	CHOKE COIL, 33 MICRO
	L11	PU56181-330	CHOKE COIL, 33 MICRO
	L12	PU59701-330	CHOKE COIL, 33 MICRO
⚠	PHC1	PC817	P.H.C.
⚠	RY1	PU59848	RELAY
⚠	T1	PU60402	SW. TRANS
⚠	HD1	PU57505	FUSE CLIP,X2
⚠	HS1	PQ32130-1-2	HEAT SINK
⚠	HS3	PQ43231	HEAT SINK(3)
⚠	SHT1	PU60477	SHEET
	SCW1	DPSP3008Z	ASSY SCREW
		DPSP3006Z	SCREW,X2
⚠	SCW2	DPSP2608Z	SCREW,X2
	SLD1	PQ32167	SHILD CASE(1)
⚠	SPC1	PQM30018-53	SPACER,X2
	CN1	PU60417-9	CAP HOUSING
	CN10	PU58844-2	CAP HOUSING
⚠	F1	QMF51J2-1R0N	FUSE,NOT INCL.S.P.S(1)PWB ASSY
⚠	F10	PU60479-4R0	MICRO FUSE
⚠	F11	PU60479-4R0	MICRO FUSE

-SWITCHING REGULATOR BOARD ASSY <02>-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA2	PB10078E2-01	S.P.S.(2)BOARD ASS'Y
	Q10	2SD1764	TRANSISTOR
	OR	2SD1796	TRANSISTOR
	Q11	2SD1764	TRANSISTOR
	OR	2SD1796	TRANSISTOR
	Q12	2SC1740S(QRS)	TRANSISTOR
	Q13	2SD1764	TRANSISTOR
	OR	2SD1796	TRANSISTOR
	Q14	2SC1740S(QRS)	TRANSISTOR
	Q15	2SD1764	TRANSISTOR
	OR	2SD1796	TRANSISTOR
⚠	Q16	2SB1186(DE)	TRANSISTOR
	Q17	2SA720	TRANSISTOR
	Q18	DTB114ES	TRANSISTOR
	Q19	DTA114ES	TRANSISTOR
	Q20	DTA143XS	TRANSISTOR
	Q21	DTC143ES	TRANSISTOR
	Q22	2SA933S	TRANSISTOR
	D20	MTZ13C	ZENER DIODE
	D21	MTZ6.8B	ZENER DIODE
	D22	HZ4A3	ZENER DIODE

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	D23	MA165	DIODE
	OR	1SS133	DIODE
	D24	11E2	DIODE
	D25	11E2	DIODE
	D26	11E2	DIODE
	D27	11E2	DIODE
	D28	MTZ15A	ZENER DIODE
	D29	11E2	DIODE
	D30	11E2	DIODE
	D31	HZS33EB1	ZENER DIODE
	D32	MTZ7.5C	ZENER DIODE
	D33	MTZ20C	ZENER DIODE
	D34	MA165	DIODE
	OR	1SS133	DIODE
	D35	1SS133	DIODE
	D36	MA27TA	DIODE
	R20	QRD161J-681	RESISTOR
	R21	QRD161J-331	RESISTOR
	R22	QRD161J-102	RESISTOR
	R23	QRD161J-122	RESISTOR
	R24	QRD161J-272	RESISTOR
	R25	QRD161J-392	RESISTOR
	R26	QRD161J-561	RESISTOR
	R27	QRD161J-471	RESISTOR
	R28	QRD161J-561	RESISTOR
	R29	QVZ3521-331	V RESISTOR,+5V ADJ
	R30	QRD161J-182	RESISTOR
	R31	QRD161J-102	RESISTOR
⚠	R32	QRH127J-1R8	FUSIBLE RESISTOR
	R33	QRD161J-392	RESISTOR
	R34	QRD161J-153	RESISTOR
⚠	R35	QRZ0077-220X	FUSIBLE RESISTOR
	R36	QRD161J-103	RESISTOR
	R37	QRD161J-222	RESISTOR
	R38	QRD181J-100	RESISTOR
	R40	QRD161J-393	RESISTOR
	R41	QRD161J-471	RESISTOR
	R48	QRD161J-331	RESISTOR
	R49	QRD161J-102	RESISTOR
	R51	QRD162J-332	RESISTOR
	C30	QETC1CM-476	E CAPACITOR
	C32	QETC1CM-107	E CAPACITOR
	C33	QFN31HJ-103	M CAPACITOR
	C35	QETC1AM-107	E CAPACITOR
	C36	QFN31HJ-103	M CAPACITOR
	C38	QETB1EM-108	E CAPACITOR
	C40	QETC1CM-107	E CAPACITOR
	C41	QETC1JM-476	E CAPACITOR
	C42	QETC1JM-476	E CAPACITOR
	C43	QETC1HM-226	E CAPACITOR
	C44	QETC1HM-226	E CAPACITOR
	C45	QETC1HM-226	E CAPACITOR
	C46	QETC1CM-107	E CAPACITOR
	C47	QETC1HM-106	E CAPACITOR
	C48	QEK61CM-106	E CAPACITOR
⚠	T2	PU60455	POWER TRANSFORMER
	CN3	PU60417-6	CAP HOUSING
	CN4	PU58844-2	CAP HOUSING
	CN5	PU58844-2	CAP HOUSING
	CN6	PU58844-3	CAP HOUSING
	CN7	PU58844-2	CAP HOUSING
	CN8	PU60417-8	CAP HOUSING
	CN9	PU58844-3	CAP HOUSING

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN11	PU58844-2	CAP HOUSING
	CN12	PU58844-2	CAP HOUSING
	CN13	PU58844-4	CAP HOUSING
⚠	CP3	ICP-F20	CIRCUIT PROTECTOR

* * *

7. MAIN BOARD ASSEMBLY <03>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB10057E-02	MAIN BOARD ASSY
	HN1	PU58018-1-2	PWB HINGE, X2
	RV1	PU52105	PLASTIC RIVET
	SLD1	PQ43396-1-1	VIDEO SHIELD
	SPC1	PQM30029-10	SPACER
	SPC2	PQM30029-28	SPACER

-VIDEO SECTION-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TP	PU57545	TEST PIN, X6
	IC1	PB20166D	Y MODULE
⚠	IC2	PB20187C	Y.MODULE
	IC3	M51647SP	IC
⚠	IC4	MN3801	IC
⚠	IC5	MN3801	IC
	IC6	MN3106	IC
	IC8	UPC319C	IC
	IC10	BU4030B	IC
	IC11	AN3211NK	IC
	IC12	BA7021	IC
	IC13	LA7220	IC
	IC14	LA7220	IC
	IC15	LA7220	IC
	IC16	LA7220	IC
	IC17	LA7220	IC
	IC18	BU4013B	IC
	IC301	PU22517D	C.MODULE
	IC302	BA7233	IC
	Q1	2SC3354(TS)	TRANSISTOR
	Q2	2SC1740S(S)	TRANSISTOR
	Q3	2SC1740S(QRS)	TRANSISTOR
	Q4	2SA933S(RS)	TRANSISTOR
	Q5	2SC1740S(QRS)	TRANSISTOR
	Q6	2SC1740S(S)	TRANSISTOR
	Q7	2SC1740S(S)	TRANSISTOR
	Q8	2SC3354(TS)	TRANSISTOR
	Q9	DTC144ES	TRANSISTOR
	Q10	DTC144ES	TRANSISTOR
	Q11	2SC1740S(QRS)	TRANSISTOR
	Q12	2SC1740S(QRS)	TRANSISTOR
	Q13	2SC1740S(QRS)	TRANSISTOR
	Q14	DTC144ES	TRANSISTOR
	Q15	DTC144ES	TRANSISTOR
	Q17	2SC3354	TRANSISTOR
	Q18	DTA114TS	TRANSISTOR
	Q19	2SC1740S(QRS)	TRANSISTOR
	Q20	2SA933S(RS)	TRANSISTOR
	Q21	DTC144ES	TRANSISTOR
	Q22	2SC1740S(QRS)	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q23	2SC1740S(QRS)	TRANSISTOR
⚠	Q24	2SC1740S(QRS)	TRANSISTOR
	Q25	2SA933S(RS)	TRANSISTOR
	Q26	2SC1740S(QRS)	TRANSISTOR
	Q27	DTA124ES	TRANSISTOR
	Q30	2SC1740S(QRS)	TRANSISTOR
	Q31	2SC1740S(QRS)	TRANSISTOR
	Q32	DTA124ES	TRANSISTOR
	Q33	2SA933S(RS)	TRANSISTOR
	Q34	DTC144ES	TRANSISTOR
	Q35	DTC144ES	TRANSISTOR
	Q37	DTA124ES	TRANSISTOR
	Q38	DTA124ES	TRANSISTOR
	Q39	DTA124ES	TRANSISTOR
	Q40	DTA124ES	TRANSISTOR
	Q41	DTA124ES	TRANSISTOR
	Q42	2SC1740S(QRS)	TRANSISTOR
	Q43	2SA933S(RS)	TRANSISTOR
	Q44	DTA124ES	TRANSISTOR
	Q45	2SA854S(R)	TRANSISTOR
	Q46	DTA124ES	TRANSISTOR
⚠	Q47	2SA854S(R)	TRANSISTOR
	Q48	DTA124ES	TRANSISTOR
	Q49	2SA854S(R)	TRANSISTOR
	Q50	2SA854S(R)	TRANSISTOR
	Q51	2SA854S(R)	TRANSISTOR
	Q52	2SA933S(RS)	TRANSISTOR
⚠	Q53	2SA933S(RS)	TRANSISTOR
	Q54	DTC144ES	TRANSISTOR
	Q56	2SC1740S(S)	TRANSISTOR
	Q57	2SC1740S(QRS)	TRANSISTOR
	Q58	2SA933S(RS)	TRANSISTOR
	Q59	2SA933S(RS)	TRANSISTOR
	Q60	DTC144ES	TRANSISTOR
	Q61	DTA124ES	TRANSISTOR
	Q62	DTC144ES	TRANSISTOR
	Q64	2SA933S(RS)	TRANSISTOR
	Q65	2SC1740S(QRS)	TRANSISTOR
	Q66	DTA124ES	TRANSISTOR
	Q69	2SA933S(RS)	TRANSISTOR
	Q70	DTC144ES	TRANSISTOR
	Q71	2SA933S(RS)	TRANSISTOR
	Q72	DTA124ES	TRANSISTOR
	Q73	DTA124ES	TRANSISTOR
	Q301	DTC144ES	TRANSISTOR
	Q302	2SC1740S(QRS)	TRANSISTOR
	Q303	2SC3354	TRANSISTOR
	Q304	DTC144WS	TRANSISTOR
	Q305	2SC3354(TS)	TRANSISTOR
	Q306	2SC1740S(QRS)	TRANSISTOR
	Q307	DTC144ES	TRANSISTOR
	Q308	2SC1740S(QRS)	TRANSISTOR
	Q309	2SC1740S(QRS)	TRANSISTOR
	Q311	2SC1740S(QRS)	TRANSISTOR
	Q312	DTA124ES	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	1SS133	DIODE
	D4	OA90	DIODE
	D5	OA90	DIODE
	D6	1SS133	DIODE
	D7	1SS133	DIODE
	D8	1SS99	DIODE
	D9	1SS99	DIODE
	D10	1SS99	DIODE

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	D11	1SS99	DIODE
	D12	MA27W(B)	DIODE
	D13	1SS133	DIODE
	D14	1SS133	DIODE
	D15	1SS133	DIODE
	D16	DAP209S	DIODE
	D19	1SS133	DIODE
	D20	1SS133	DIODE
	D21	1SS133	DIODE
	D22	1SS133	DIODE
	D23	1SS133	DIODE
	D25	1SS133	DIODE
	D26	1SS133	DIODE
	D27	1SS133	DIODE
	D28	1SS133	DIODE
	D29	1SS133	DIODE
	D31	1SS133	DIODE
	D32	1SS133	DIODE
	D33	1SS133	DIODE
	D34	1SS133	DIODE
	D35	1SS133	DIODE
	D36	1SS133	DIODE
	D37	1SS133	DIODE
	D38	1SS133	DIODE
	D39	1SS133	DIODE
	D40	1SS133	DIODE
	D41	1SS133	DIODE
	D42	1SS133	DIODE
	D43	1SS133	DIODE
	D44	1SS133	DIODE
	D45	1SS133	DIODE
	D46	1SS133	DIODE
	D47	1SS133	DIODE
	D48	1SS133	DIODE
	D49	1SS133	DIODE
	D50	1SS133	DIODE
	D51	1SS133	DIODE
	D52	1SS133	DIODE
	D53	1SS133	DIODE
	D54	1SS133	DIODE
	D55	1SS133	DIODE
	D60	1SS133	DIODE
	D61	1SS133	DIODE
	D62	1SS133	DIODE
	D64	1SS133	DIODE
	D66	1SS133	DIODE
	D67	1SS133	DIODE
	D68	1SS133	DIODE
	D70	1SS133	DIODE
	D71	1SS133	DIODE
	D72	1SS133	DIODE
	D73	1SS133	DIODE
	D76	1SS133	DIODE
	D77	1SS133	DIODE
	D79	1SS133	DIODE
	D80	1SS133	DIODE
	D81	1SS133	DIODE
	D83	1SS133	DIODE
	D85	1SS133	DIODE
	D88	1SS133	DIODE
	D89	1SS133	DIODE
	D91	1SS133	DIODE
	D92	1SS133	DIODE
	D93	1SS133	DIODE
	D95	1SS133	DIODE
	D96	1SS133	DIODE

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	D97	1SS133	DIODE
	D100	1SS133	DIODE
	D101	1SS133	DIODE
	D102	1SS133	DIODE
	D301	1SS133	DIODE
	D302	1SS133	DIODE
	D303	1SS133	DIODE
	D304	1SS133	DIODE
	D305	1SS133	DIODE
	R1	QRD161J-123	RESISTOR
	R2	QRD161J-123	RESISTOR
	R3	QVZ3518-103	V RESISTOR, CCD BIAS 1
	R4	QRD161J-123	RESISTOR
	R5	QRD161J-223	RESISTOR
	R6	QRD161J-103	RESISTOR
	R7	QRD161J-103	RESISTOR
	R8	QRD161J-333	RESISTOR
	R9	QRD161J-102	RESISTOR
	R10	QRD161J-102	RESISTOR
	R11	QRD161J-393	RESISTOR
	R12	QRD161J-561	RESISTOR
	R13	QRD161J-102	RESISTOR
	R14	QRD161J-102	RESISTOR
	R15	QRD161J-102	RESISTOR
	R16	QRD161J-472	RESISTOR
	R17	QRD161J-222	RESISTOR
	R18	QRD161J-562	RESISTOR
	R19	QRD161J-103	RESISTOR
	R20	QVZ3518-103	V RESISTOR, CCD BIAS 2
	R21	QRD161J-123	RESISTOR
	R22	QRD161J-225	RESISTOR
	R23	QRD161J-103	RESISTOR
	R24	QRD161J-103	RESISTOR
	R25	QRD161J-102	RESISTOR
	R26	QRD161J-222	RESISTOR
	R27	QRD161J-182	RESISTOR
	R28	QVZ3518-102	V RESISTOR, YNR NC BALANCE
	R29	QRD161J-223	RESISTOR
	R30	QRD161J-184	RESISTOR
	R31	QRD161J-271	RESISTOR
	R32	QRD161J-121	RESISTOR
	R33	QRD161J-471	RESISTOR
	R34	QRD161J-122	RESISTOR
	R35	QRD161J-471	RESISTOR
	R36	QRD161J-222	RESISTOR
	R37	QRD161J-472	RESISTOR
	R38	QRD161J-103	RESISTOR
	R39	QRD161J-682	RESISTOR
	R40	QVZ3518-471	V RESISTOR, COLOR COMB ADJ
	R41	QRD161J-391	RESISTOR
	R42	QRD161J-821	RESISTOR
	R43	QRD161J-152	RESISTOR
	R44	QRD161J-471	RESISTOR
	R45	QVZ3518-102	V RESISTOR, Y COMB ADJ
	R46	QRD161J-561	RESISTOR
	R47	ERS-A39J-561T	THERMISTOR
	R48	QVZ3518-681	V RESISTOR, Y COMB ADJ
	R49	QRD161J-102	RESISTOR
	R50	QRD161J-272	RESISTOR
	R51	QRD161J-153	RESISTOR
	R52	QRD161J-273	RESISTOR
	R59	QRD161J-182	RESISTOR
	R60	QRD161J-473	RESISTOR
	R65	QRD161J-123	RESISTOR
	R66	QRD161J-822	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R67	QRD161J-104	RESISTOR
	R68	QRD161J-103	RESISTOR
	R69	QRD161J-474	RESISTOR
	R71	QVZ3518-151	V RESISTOR, PROCES INPUT LEV
	R72	QRD161J-241	RESISTOR
	R73	QRD161J-391	RESISTOR
	R74	QRD161J-471	RESISTOR
	R75	QRD161J-332	RESISTOR
	R76	QRD161J-332	RESISTOR
	R77	QRD161J-471	RESISTOR
	R79	QRD161J-821	RESISTOR
	R80	QRD161J-103	RESISTOR
	R82	QRD161J-222	RESISTOR
	R83	QRD161J-102	RESISTOR
	R84	QRD161J-102	RESISTOR
	R85	QRD161J-752	RESISTOR
	R86	QRD161J-561	RESISTOR
	R87	QRD161J-102	RESISTOR
	R88	QRD161J-223	RESISTOR
	R89	QRD161J-332	RESISTOR
	R90	QRD161J-431	RESISTOR
	R92	QRD161J-102	RESISTOR
	R93	QRD161J-122	RESISTOR
	R94	QRD161J-472	RESISTOR
	R95	QRD161J-102	RESISTOR
	R96	QRD161J-472	RESISTOR
	R97	QRD161J-103	RESISTOR
	R98	QRD161J-391	RESISTOR
	R99	QRD161J-332	RESISTOR
	R100	QRD161J-241	RESISTOR
	R101	QRD161J-392	RESISTOR
	R102	QRD161J-470	RESISTOR
	R103	QRD161J-102	RESISTOR
	R104	QRD161J-122	RESISTOR
	R105	QRD161J-102	RESISTOR
	R106	QRD161J-471	RESISTOR
	R107	QRD161J-821	RESISTOR
	R108	QRD161J-821	RESISTOR
	R109	QVZ3518-102	V RESISTOR, REC FM LEV(N-MODE)
	R110	QRD161J-103	RESISTOR
	R111	QRD161J-223	RESISTOR
	R113	QRD161J-391	RESISTOR
	R114	QRD161J-681	RESISTOR
	R115	QRD161J-391	RESISTOR
	R116	QVZ3518-102	V RESISTOR, REC FM LEV(S-MODE)
	R117	QRD161J-223	RESISTOR
	R118	QRD161J-153	RESISTOR
	R119	QRD161J-681	RESISTOR
	R120	QRD161J-102	RESISTOR
	R121	QRD161J-102	RESISTOR
	R122	QRD161J-124	RESISTOR
	R123	QRD161J-822	RESISTOR
	R125	QRD161J-102	RESISTOR
	R126	QVZ3518-473	V RESISTOR, PB Y LEV(S-MODE)
	R127	QRD161J-223	RESISTOR
	R131	QVZ3518-333	V RESISTOR, PB Y LEV(N-MODE)
	R132	QRD161J-103	RESISTOR
	R133	QRD161J-222	RESISTOR
	R134	QRD161J-102	RESISTOR
	R135	QRD161J-272	RESISTOR
	R137	QRD161J-681	RESISTOR
	R138	QRD161J-392	RESISTOR
	R139	QRD161J-104	RESISTOR
	R140	QRD161J-103	RESISTOR
	R141	QRD161J-562	RESISTOR
	R142	QRD161J-103	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R143	QRD161J-152	RESISTOR
	R145	QRD161J-104	RESISTOR
	R146	QRD161J-104	RESISTOR
	R147	QRD161J-103	RESISTOR
	R149	QRD161J-272	RESISTOR
	R150	QRD161J-393	RESISTOR
	R151	QRD161J-393	RESISTOR
	R152	QRD161J-272	RESISTOR
	R153	QRD161J-273	RESISTOR
	R154	QRD161J-822	RESISTOR
	R155	QRD161J-222	RESISTOR
	R156	QRD161J-472	RESISTOR
	R158	QRD123J-391	RESISTOR
	R159	QRD123J-391	RESISTOR
	R160	QRD123J-391	RESISTOR
	R161	QRD161J-750	RESISTOR
	R162	QRD161J-750	RESISTOR
	R163	QRD161J-750	RESISTOR
	R164	QRD161J-102	RESISTOR
	R165	QRD161J-102	RESISTOR
	R166	QRD161J-102	RESISTOR
	R167	QRD161J-393	RESISTOR
	R168	QRD161J-472	RESISTOR
	R169	QRD161J-103	RESISTOR
	R170	QRD161J-102	RESISTOR
	R171	QRD161J-102	RESISTOR
	R172	QRD161J-102	RESISTOR
	R173	QRD161J-102	RESISTOR
	R174	QRD161J-473	RESISTOR
	R175	QRD161J-472	RESISTOR
	R176	QRD161J-103	RESISTOR
	R177	QRD161J-473	RESISTOR
	R178	QRD161J-473	RESISTOR
	R180	QRD162J-103	RESISTOR
	R182	QRD161J-471	RESISTOR
	R183	QRD161J-331	RESISTOR
	R184	QRD161J-222	RESISTOR
	R185	QRD161J-393	RESISTOR
	R186	QRD161J-103	RESISTOR
	R190	QRD161J-472	RESISTOR
	R193	QRD161J-473	RESISTOR
	R194	QRD161J-393	RESISTOR
	R196	QRD161J-102	RESISTOR
	R197	QRD161J-102	RESISTOR
	R198	QRD161J-332	RESISTOR
	R199	QRD161J-152	RESISTOR
	R200	QRD161J-152	RESISTOR
	R201	QRD161J-152	RESISTOR
	R202	QRD161J-153	RESISTOR
	R203	QRD161J-393	RESISTOR
	R204	QVZ3518-103	V RESISTOR, E-E LEVEL
	R205	QRD161J-332	RESISTOR
	R206	QRD161J-393	RESISTOR
	R207	QRD161J-101	RESISTOR
	R214	QRD161J-272	RESISTOR
	R215	QRD161J-272	RESISTOR
	R216	QRD161J-105	RESISTOR
	R217	QRD161J-272	RESISTOR
	R218	QRD161J-103	RESISTOR
	R220	QRD161J-475	RESISTOR
	R221	QRD161J-103	RESISTOR
	R222	QRD161J-152	RESISTOR
	R223	QRD161J-272	RESISTOR
	R224	QRD161J-152	RESISTOR
	R225	QRD161J-331	RESISTOR
	R226	QRD161J-333	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R227	QRD161J-562	RESISTOR
	R228	QRD161J-182	RESISTOR
	R229	QRD161J-152	RESISTOR
	R230	QRD161J-125	RESISTOR
	R231	QRD161J-102	RESISTOR
	R232	QRD161J-102	RESISTOR
	R233	QRD161J-102	RESISTOR
	R234	QRD161J-333	RESISTOR
	R235	QRD161J-152	RESISTOR
	R236	QRD161J-185	RESISTOR
	R237	QRD161J-273	RESISTOR
	R240	QRD161J-103	RESISTOR
	R241	QRD161J-102	RESISTOR
	R242	QRD161J-105	RESISTOR
	R243	QRD161J-105	RESISTOR
	R244	QRD161J-104	RESISTOR
	R246	QRD161J-223	RESISTOR
	R247	QRD161J-273	RESISTOR
	R248	PU52108-2R2	POSISTOR
	OR	PU52108-2R2T	POSISTOR
	R249	QRD161J-392	RESISTOR
	R251	QRD161J-184	RESISTOR
	R252	QRD161J-560	RESISTOR
	R301	QRD161J-102	RESISTOR
	R302	QRD161J-332	RESISTOR
	R303	QRD161J-152	RESISTOR
	R304	QRD161J-103	RESISTOR
	R305	QRD161J-222	RESISTOR
	R306	QRD161J-102	RESISTOR
	R307	QRD161J-152	RESISTOR
	R308	QRD161J-102	RESISTOR
	R309	QRD161J-102	RESISTOR
	R310	QRD161J-102	RESISTOR
	R311	QRD161J-182	RESISTOR
	R312	QRD161J-102	RESISTOR
	R313	QVZ3518-471	V RESISTOR, SP COLOR LEVEL
	R314	QVZ3518-471	V RESISTOR, EP COLOR LEVEL
	R315	QRD161J-103	RESISTOR
	R316	QRD161J-682	RESISTOR
	R317	QRD161J-123	RESISTOR
	R318	QRD161J-332	RESISTOR
	R319	QRD161J-273	RESISTOR
	R320	QRD161J-102	RESISTOR
	R321	QVZ3518-471	V RESISTOR, CNR FB
	R322	QRD161J-101	RESISTOR
	R323	QVZ3518-472	V RESISTOR, CNR NC BAL
	R324	QRD161J-561	RESISTOR
	R325	QRD161J-561	RESISTOR
	R326	QRD161J-223	RESISTOR
	R328	QVZ3518-222	V RESISTOR, CNR INPUT LEVEL
	R329	QRD161J-102	RESISTOR
	R330	QRD161J-562	RESISTOR
	R331	QRD161J-473	RESISTOR
	R332	QRD161J-473	RESISTOR
	R333	QRD161J-123	RESISTOR
	R334	QRD161J-222	RESISTOR
	R335	QRD161J-152	RESISTOR
	R336	QRD161J-472	RESISTOR
	R337	QRD161J-561	RESISTOR
	R338	QRD161J-471	RESISTOR
	R339	QRD161J-472	RESISTOR
	C2	QEK60JM-476	E CAPACITOR
	C3	QCVB1CN-103	CAPACITOR
	C4	QCSB1HJ-100	CAPACITOR
	C5	QCSB1HJ-100	CAPACITOR
	C6	QCVB1CN-103	CAPACITOR

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C7	QEK61HM-105	E CAPACITOR
	C8	QCVB1CN-103	CAPACITOR
	C9	QCVB1CN-103	CAPACITOR
	C10	QCVB1CN-103	CAPACITOR
	C11	QCVB1CN-103	CAPACITOR
*	C12	QEK61EM-475	E CAPACITOR
	C13	QCBB1HJ-151	CAPACITOR
	C14	QCVB1CN-103	CAPACITOR
	C16	QCC31CJ-472	CAPACITOR
	C17	QEK61HM-225	E CAPACITOR
	C18	QCVB1CN-103	CAPACITOR
	C20	QEK60JM-476	E CAPACITOR
	C21	QCVB1CN-103	CAPACITOR
	C22	QEK61EM-475	E CAPACITOR
	C25	QEK60JM-476	E CAPACITOR
	C26	QCVB1CN-103	CAPACITOR
	C27	QCVB1CN-103	CAPACITOR
	C28	QCSB1HJ-100	CAPACITOR
	C29	QEK61HM-105	E CAPACITOR
	C30	QCVB1CN-103	CAPACITOR
	C31	QCVB1CN-103	CAPACITOR
	C32	QCVB1CN-103	CAPACITOR
	C33	QCVB1CN-103	CAPACITOR
	C34	QETC1CM-106	E CAPACITOR
	C35	QEK61CM-476	E CAPACITOR
	C36	QEK61HM-334	E CAPACITOR
	C37	QEK60JM-476	E CAPACITOR
	C38	QCVB1CN-103	CAPACITOR
	C39	QCT25RH-200	CAPACITOR
	OR	QCT05RH-200	CAPACITOR
	C40	QCT05TH-470	CAPACITOR
	OR	QCT25TH-470	CAPACITOR
	C41	QCT05TH-390	CAPACITOR
	OR	QCT25TH-390	CAPACITOR
	C42	QCVB1CN-103	CAPACITOR
	C43	QCT25RH-390	CAPACITOR
	OR	QCT05RH-390	CAPACITOR
	C44	QETC1CM-227	E CAPACITOR
	C45	QCVB1CN-103	CAPACITOR
	C46	QCVB1CN-103	CAPACITOR
	C47	QETC1CM-476	E CAPACITOR
	C48	QCVB1CN-103	CAPACITOR
	C49	QETC1CM-106	E CAPACITOR
	C50	QCVB1CN-103	CAPACITOR
	C51	QCVB1CN-103	CAPACITOR
	C52	QETC1CM-476	E CAPACITOR
	C53	QCVB1CN-103	CAPACITOR
	C55	QCVB1CN-103	CAPACITOR
	C56	QETC0JM-476	E CAPACITOR
	C57	QETC1CM-106	E CAPACITOR
	C58	QETC0JM-476	E CAPACITOR
	C59	QETC1EM-475	E CAPACITOR
	C60	QETC1EM-475	E CAPACITOR
	C61	QETC1EM-475	E CAPACITOR
	C62	QETC1AM-336	E CAPACITOR
	C63	QCSB1HJ-390	CAPACITOR
	C64	QCVB1CN-103	CAPACITOR
	C65	QCSB1HJ-180	CAPACITOR
	C66	QETC1CM-226	E CAPACITOR
	C67	QETC1CM-106	E CAPACITOR
	C68	QCXB1CM-222	CAPACITOR
	C69	QCBB1HJ-221	CAPACITOR
	C70	QCBB1HJ-151	CAPACITOR
	C71	QCBB1HJ-102	CAPACITOR
	C72	QCSB1HJ-330	CAPACITOR
	C73	QCBB1HJ-101	CAPACITOR
	C74	QCBB1HJ-102	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C75	QCF31HP-223	CAPACITOR
	C76	QCBB1HJ-151	CAPACITOR
	C77	QCBB1HJ-102	CAPACITOR
	C78	QCBB1HJ-102	CAPACITOR
	C79	QCVB1CN-103	CAPACITOR
	C80	QETC1CM-476	E CAPACITOR
	C81	QCBB1HJ-151	CAPACITOR
	C82	QCBB1HJ-151	CAPACITOR
	C83	QCVB1CN-103	CAPACITOR
	C84	QCVB1CN-103	CAPACITOR
	C85	QCVB1CN-103	CAPACITOR
	C86	QCSB1HJ-120	CAPACITOR
	C87	QCSC1HJ-270	CAPACITOR
	C88	QETC1EM-475	E CAPACITOR
	C89	QCVB1CN-103	CAPACITOR
	C90	QCVB1CN-103	CAPACITOR
	C91	QETC1HM-224	E CAPACITOR
	C92	QEK60JM-476	E CAPACITOR
	C93	QCVB1CN-103	CAPACITOR
	C94	QETC0JM-337	E CAPACITOR
	C95	QCSB1HJ-120	CAPACITOR
	C96	QCVB1CN-103	CAPACITOR
	C97	QCBB1HJ-820	CAPACITOR
	C98	QCVB1CN-103	CAPACITOR
	C99	QCSB1HJ-220	CAPACITOR
	C100	QETC1AM-226	E CAPACITOR
	C101	QETC1HM-105	E CAPACITOR
	C102	QETC1HM-225	E CAPACITOR
	C103	QETC1HM-105	E CAPACITOR
	C106	QCBB1HJ-181	CAPACITOR
	C107	QCVB1CN-103	CAPACITOR
	C108	QCVB1CN-103	CAPACITOR
	C109	QEK61EM-475	E CAPACITOR
	C110	QETC1HM-474	E CAPACITOR
	C111	QETC1EM-335	E CAPACITOR
	C112	QCVB1CN-103	CAPACITOR
	C113	QETC0JM-107	E CAPACITOR
	C116	QCVB1CN-103	CAPACITOR
	C118	QETC1EM-335	E CAPACITOR
	C119	QETC1EM-475	E CAPACITOR
	C120	QETA0JM-477	E CAPACITOR
	C121	QETC0JM-477	E CAPACITOR
	C122	QCVB1CN-103	CAPACITOR
	C123	QCVB1CN-103	CAPACITOR
	C124	QETC1CM-476	E CAPACITOR
	C125	QCVB1CN-103	CAPACITOR
	C126	QETC1CM-476	E CAPACITOR
	C127	QCSB1HJ-150	CAPACITOR
	C129	QETA0JM-336	E CAPACITOR
	C130	QCVB1CN-103	CAPACITOR
	C131	QETC1EM-475	E CAPACITOR
	C132	QETC1EM-475	E CAPACITOR
	C133	QETC1EM-475	E CAPACITOR
	C134	QETC1CM-106	E CAPACITOR
	C135	QETC1EM-475	E CAPACITOR
	C136	QEN61EM-335	NP E CAPACITOR
	C137	QCVB1CN-103	CAPACITOR
	C138	QCVB1CN-103	CAPACITOR
	C139	QCVB1CN-103	CAPACITOR
	C140	QCVB1CN-103	CAPACITOR
	C141	QCVB1CN-103	CAPACITOR
	C142	QETA0JM-337	E CAPACITOR
	C143	QCVB1CN-103	CAPACITOR
	C144	QCVB1CN-103	CAPACITOR
	C145	QCVB1CN-103	CAPACITOR
	C146	QCBB1HJ-101	CAPACITOR
	C147	QCVB1CN-103	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C149	QCVB1CN-103	CAPACITOR
	C151	QCVB1CN-103	CAPACITOR
	C152	QETC1CM-106	E CAPACITOR
	C153	QETC1AM-336	E CAPACITOR
	C154	QETA1CM-106	E CAPACITOR
	C156	QETC1CM-106	E CAPACITOR
	C157	QETA1AM-336	E CAPACITOR
	C158	QETC1EM-475	E CAPACITOR
	C160	QETC1CM-106	E CAPACITOR
	C161	QCVB1CN-103	CAPACITOR
	C162	QCSB1HJ-560	CAPACITOR
	C163	QCVB1CN-103	CAPACITOR
	C164	QCVB1CN-103	CAPACITOR
	C165	QCVB1CN-103	CAPACITOR
	C166	QCVB1CN-103	CAPACITOR
	C167	QETC1AM-476	E CAPACITOR
	C168	QETC1CM-106	E CAPACITOR
	C169	QETC1CM-106	E CAPACITOR
	C170	QETC1CM-106	E CAPACITOR
	C171	QETC1CM-106	E CAPACITOR
	C172	QCVB1CN-103	CAPACITOR
	C173	QETC1HM-224	E CAPACITOR
	C174	QCVB1CN-103	CAPACITOR
	C175	QETC0JM-107	E CAPACITOR
	C176	QETC1HM-225	E CAPACITOR
	C177	QETC1EM-475	E CAPACITOR
	C178	QETC1EM-475	E CAPACITOR
	C179	QETA1AM-226	E CAPACITOR
	OR	QEK41AM-226	E CAPACITOR
	C180	QCXB1CM-222	CAPACITOR
	C181	QEK60JM-476	E CAPACITOR
	C182	QCVB1CN-103	CAPACITOR
	C183	QEN61HM-105	NP E CAPACITOR
	C184	QETC1HM-105	E CAPACITOR
	C185	QETC1HM-105	E CAPACITOR
	C186	QCVB1CN-103	CAPACITOR
	C189	QETC0JM-107	E CAPACITOR
	C190	QEN61HM-105	NP E CAPACITOR
	C193	QCVB1CN-103	CAPACITOR
	C194	QCVB1CN-103	CAPACITOR
	C195	QFN41HJ-223	M CAPACITOR
	C196	QCVB1CN-103	CAPACITOR
	C197	QCBB1HJ-102	CAPACITOR
	C198	QCSB1HJ-470	CAPACITOR
	C199	QCS31HJ-120	CAPACITOR
	C201	QCSB1HJ-270	CAPACITOR
	C203	QCVB1CN-103	CAPACITOR
	C204	QCSB1HJ-150	CAPACITOR
	C205	QCBB1HJ-151	CAPACITOR
	C206	QCBB1HJ-101	CAPACITOR
	C207	QCBB1HJ-820	CAPACITOR
	C208	QEK61AM-226	E CAPACITOR
	C209	QCBB1HJ-102	CAPACITOR
	C210	QCBB1HJ-102	CAPACITOR
	C211	QCBB1HJ-102	CAPACITOR
	C212	QCBB1HJ-102	CAPACITOR
	C213	QCBB1HJ-102	CAPACITOR
	C215	QCVB1CN-103	CAPACITOR
	C216	QCVB1CN-103	CAPACITOR
	C217	QCT05CH-101	CAPACITOR
	OR	QCT25CH-101	CAPACITOR
	C218	QCSB1HJ-330	CAPACITOR
	C219	QCSB1HJ-330	CAPACITOR
	C220	QCSB1HJ-220	CAPACITOR
	C221	QCSB1HJ-680	CAPACITOR
	C222	QCBB1HJ-101	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C223	QCBB1HJ-102	CAPACITOR
	C224	QCSB1HJ-100	CAPACITOR
	C225	QCBB1HJ-181	CAPACITOR
	C226	QCBB1HJ-102	CAPACITOR
	C227	QCBB1HJ-102	CAPACITOR
	C228	QCT05CH-221	CAPACITOR
	C229	QEK41CM-226	E CAPACITOR
	C231	QCSB1HJ-220	CAPACITOR
	C234	QCBB1HJ-561	CAPACITOR
	C301	QETC0JM-337	E CAPACITOR
	C302	QETC1EM-475	E CAPACITOR
	C303	QETC1HM-224	E CAPACITOR
	C304	QEN61HM-474	NP E CAPACITOR
	C305	QETC1HM-104	E CAPACITOR
	C306	QCVB1CN-103	CAPACITOR
	C307	QCVB1CN-103	CAPACITOR
	C308	QCBB1HJ-820	CAPACITOR
	C309	QETC0JM-337	E CAPACITOR
	C310	QETC1EM-335	E CAPACITOR
	C312	QCVB1CN-103	CAPACITOR
	C313	QETC1HM-474	E CAPACITOR
	C314	QCVB1CN-103	CAPACITOR
	C315	QCVB1CN-103	CAPACITOR
	C316	QCSB1HJ-560	CAPACITOR
	C317	QCSB1HJ-270	CAPACITOR
	C318	QCC31CJ-473	CAPACITOR
	C319	QCVB1CN-103	CAPACITOR
	C320	QCVB1CN-103	CAPACITOR
	C321	QCVB1CN-103	CAPACITOR
	C322	QCT25CH-101	CAPACITOR
	C323	QCVB1CN-103	CAPACITOR
	C324	QCVB1CN-103	CAPACITOR
	C325	QCVB1CN-103	CAPACITOR
	C326	QCVB1CN-103	CAPACITOR
	C327	QETC1HM-105	E CAPACITOR
	C330	QETC0JM-476	E CAPACITOR
	C331	QETC0JM-476	E CAPACITOR
	C332	QCVB1CN-103	CAPACITOR
	C333	QCVB1CN-103	CAPACITOR
	C334	QCVB1CN-103	CAPACITOR
	C335	QCBB1HJ-121	CAPACITOR
	C337	QCBB1HJ-331	CAPACITOR
	C338	QCVB1CN-103	CAPACITOR
	C339	QER61CM-106	E CAPACITOR
	C341	QFN31HJ-562	M CAPACITOR
	C342	QCVB1CN-103	CAPACITOR
	C343	QCS31HJ-6R0	CAPACITOR
	C344	QCSB1HJ-150	CAPACITOR
	C345	QCVB1CN-103	CAPACITOR
	C346	QCVB1CN-103	CAPACITOR
	C347	QCSB1HJ-150	CAPACITOR
	L1	PU48530-101K	PEAKING COIL, 100 MICRO
	L2	PU48530-1R2K	PEAKING COIL, 1.2 MICRO
	L3	PU48530-101K	PEAKING COIL, 100 MICRO
	L5	PU59152-101J	PEAKING COIL, 100 MICRO
⚠	L6	PU59152-270J	PEAKING COIL, 27 MICRO
	L7	PU48530-101K	PEAKING COIL, 100 MICRO
	L8	PU54223-101J	PEAKING COIL, 100 MICRO
	L9	PU59152-101J	PEAKING COIL, 100 MICRO
	L10	PU59152-470J	PEAKING COIL, 47 MICRO
	L11	PU48530-101K	PEAKING COIL, 100 MICRO
	L12	PU59152-470J	PEAKING COIL, 47 MICRO
	L13	PU48530-471J	PEAKING COIL, 470 MICRO
	L14	PU59152-680J	PEAKING COIL, 68 MICRO
	L15	PU48530-101K	PEAKING COIL, 100 MICRO

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	L16	PU48530-471K	PEAKING COIL, 470 MICRO
	L17	PU48530-560J	PEAKING COIL, 56 MICRO
	L18	PU59152-121J	PEAKING COIL, 120 MICRO
	L19	PU59152-820J	PEAKING COIL, 82 MICRO
	L20	PU59152-680J	PEAKING COIL, 68 MICRO
	L21	PU48530-101K	PEAKING COIL, 100 MICRO
	L22	PU48530-101K	PEAKING COIL, 100 MICRO
	L23	PU48530-101K	PEAKING COIL, 100 MICRO
	L24	PU48530-101K	PEAKING COIL, 100 MICRO
	L25	PU59152-820J	PEAKING COIL, 82 MICRO
	L26	PU48530-101K	PEAKING COIL, 100 MICRO
	L27	PU48530-101K	PEAKING COIL, 100 MICRO
	L28	PU48530-151K	PEAKING COIL, 150 MICRO
	L29	PU48530-101K	PEAKING COIL, 100 MICRO
	L30	PU48530-101K	PEAKING COIL, 100 MICRO
	L31	PU59152-270J	PEAKING COIL, 27 MICRO
	L32	PU48530-1R0K	PEAKING COIL, 1 MICRO
	L33	PU59152-330J	PEAKING COIL, 33 MICRO
	L34	PU53223-1R0G	PEAKING COIL, 1 MICRO
	L35	PU59152-1R2K	PEAKING COIL, 1.2 MICRO
	L36	PU53223-1R0G	PEAKING COIL, 1 MICRO
	L37	PU59152-820J	PEAKING COIL, 82 MICRO
	L301	PU60165-120G	PEAKING COIL, 12 MICRO
	L302	PU59153-101K	INDUCTOR, 100 MICRO
	L303	PU48530-471J	PEAKING COIL, 470 MICRO
	L304	PU48530-222J	PEAKING COIL, 2.2M
	L305	PU59152-150J	PEAKING COIL, 15 MICRO
	L306	PU48530-101K	PEAKING COIL, 100 MICRO
	L307	PU48530-271J	PEAKING COIL, 270 MICRO
	L308	PU58308-822J	COIL, 8.2M
	L309	PU48530-101K	PEAKING COIL, 100 MICRO
	L311	PU48530-102J	PEAKING COIL, 1M
	L312	PU59152-181J	PEAKING COIL, 180 MICRO
	L313	PU59152-181J	PEAKING COIL, 180 MICRO
	L314	PU59152-820J	PEAKING COIL, 82 MICRO
	EQ1	PU60429	EQUALIZER
	EQ3	PU60099	EQUALIZER
	EQ302	PU60432	EQUALIZER
	LPF1	PU60054-2	LOW PASS FILTER
	LPF2	PU60097-2	LOW PASS FILTER
	LPF3	PU60427	LOW PASS FILTER
	LPF4	PU60179	LOW PASS FILTER
	LPF5	PU60443	LOW PASS FILTER
	LPF301	PU60430-2	LOW PASS FILTER
	BPF1	PU57399-2	BAND PASS FILTER
		OR PU57399-3	BAND PASS FILTE
	BPF2	PU60428	BAND PASS FILTER
	BPF3	PU57399-2	BAND PASS FILTER
		OR PU57399-3	BAND PASS FILTE
	BPF301	PU60431	BAND PASS FILTER
	DL301	PU60227	1H DELAY LINE
	DL302	PU58294	DELAY LINE
⚠•	X301	PU60059	CRYSTAL RESONATOR
⚠		OR PU60323	CRYSTAL RESONATOR
	T301	PU60057-2	T FILTER
	T302	PU58295	COIL, CNR NC BALANCE
	SLD1	PU36446	SHIELD CASE
	SLD2	PU60425	SHIELD COVER
	SLD3	PU60426	SHIELD PLATE
	TP	PU57545	TEST PIN, X6

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	SPC1	PQM30029-25	SPACER
	CN1	PU58844-9	CAP HOUSING
	CN2	PU58844-4	CAP HOUSING
	CN3	PU58844-3	CAP HOUSING
	CN4	PU58844-14	CAP HOUSING
	CN5	PU58844-10	CAP HOUSING
	CN6	PU60417-8	CAP HOUSING
	CN7	PU58844-4	CAP HOUSING
	CN8	PU60417-5	CAP HOUSING
	CN9	PU59555-2	CAP HOUSING
	CN10	PU58844-2	CAP HOUSING
	CN11	PU58844-2	CAP HOUSING
	CN12	PU58844-6	CAP HOUSING
	CN13	PU58844-4	CAP HOUSING
	CN14	PU58844-7	CAP HOUSING
	CN15	PU58844-3	CAP HOUSING
	CP1	ICP-F10	CIRCUIT PROTECT

-SERVO SECTION-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	IC421	HD49712ANT	IC
	IC461	BU2767S	IC
	Q402	DTA124ES	TRANSISTOR
		OR UN4112	TRANSISTOR
		OR 2SA1346	TRANSISTOR
	Q403	DTA124ES	TRANSISTOR
		OR UN4112	TRANSISTOR
		OR 2SA1346	TRANSISTOR
	Q404	DTA124ES	TRANSISTOR
		OR UN4112	TRANSISTOR
		OR 2SA1346	TRANSISTOR
	Q405	DTA124ES	TRANSISTOR
		OR UN4112	TRANSISTOR
		OR 2SA1346	TRANSISTOR
	Q406	DTC124ES	TRANSISTOR
		OR UN4212	TRANSISTOR
		OR 2SC3400	TRANSISTOR
	Q408	2SA1309Q,R,S	TRANSISTOR
	Q422	2SC3311A	TRANSISTOR
	Q423	DTA124ES	TRANSISTOR
		OR UN4112	TRANSISTOR
		OR 2SA1346	TRANSISTOR
	Q461	DTA124ES	TRANSISTOR
		OR 2SA1346	TRANSISTOR
		OR UN4112	TRANSISTOR
	Q463	2SD1468S(SE)	TRANSISTOR
	Q464	2SD1468S(SE)	TRANSISTOR
	Q465	DTC124ES	TRANSISTOR
		OR UN4212	TRANSISTOR
		OR 2SC3400	TRANSISTOR
	D401	HSS101-01	DIODE
		OR 1SS101	DIODE
	D405	1SS133	DIODE
		OR MA165	DIODE
	D406	1SS133	DIODE
		OR MA165	DIODE
	D407	1SS133	DIODE
		OR MA165	DIODE
	D408	1SS133	DIODE
		OR MA165	DIODE
	D409	1SS133	DIODE
		OR MA165	DIODE
	D421	1SS133	DIODE
		OR MA165	DIODE
	D422	1SS133	DIODE

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
		OR MA165	DIODE
	D423	1SS133	DIODE
		OR MA165	DIODE
	D424	1SS133	DIODE
		OR MA165	DIODE
	D425	1SS133	DIODE
		OR MA165	DIODE
	D426	1SS133	DIODE
		OR MA165	DIODE
	D461	11E2	DIODE
	D465	1SS133	DIODE
		OR MA165	DIODE
	D467	1SS133	DIODE
		OR MA165	DIODE
	D468	1SS133	DIODE
		OR MA165	DIODE
	D470	1SS133	DIODE
	D473	1SS133	DIODE
	D474	1SS133	DIODE
	R401	QRD161J-102	RESISTOR
	R403	QRD161J-823	RESISTOR
	R406	QRD161J-472	RESISTOR
	R407	QRD161J-393	RESISTOR
	R408	QVZ3518-474	V RESISTOR, EP X2 PRESET
	R409	QRD161J-274	RESISTOR
	R410	QVZ3518-474	V RESISTOR, SP X2 PRESET
	R414	QRD161J-335	RESISTOR
	R415	QRD161J-823	RESISTOR
	R416	QRD161J-331	RESISTOR
	R417	QRD161J-223	RESISTOR
	R421	QRD161J-102	RESISTOR
	R422	QRD161J-155	RESISTOR
	R425	QRD161J-105	RESISTOR
	R426	QRD161J-562	RESISTOR
	R428	QRD161J-222	RESISTOR
	R429	QRD161J-563	RESISTOR
	R430	QRD161J-105	RESISTOR
	R431	QRD161J-123	RESISTOR
	R432	QRD161J-223	RESISTOR
	R433	QRD161J-392	RESISTOR
	R434	QRD161J-473	RESISTOR
	R435	QRD161J-105	RESISTOR
	R436	QRD161J-105	RESISTOR
	R437	QRD161J-105	RESISTOR
	R438	QRD161J-393	RESISTOR
	R439	QRD161J-223	RESISTOR
	R440	QRD161J-105	RESISTOR
	R441	QRD161J-823	RESISTOR
	R443	QRD161J-102	RESISTOR
	R444	QRD161J-124	RESISTOR
	R445	QVZ3518-474	V RESISTOR, SP PB SW POINT
	R446	QRD161J-103	RESISTOR
	R447	QRD161J-222	RESISTOR
	R448	QRD161J-221	RESISTOR
	R449	QRD161J-223	RESISTOR
	R450	QRD161J-472	RESISTOR
	R451	QRD161J-103	RESISTOR
	R452	QRD161J-102	RESISTOR
	R453	QRD161J-103	RESISTOR
	R454	QRD161J-561	RESISTOR
	R455	QRD161J-223	RESISTOR
	R456	QRD161J-682	RESISTOR
	R457	QRD161J-102	RESISTOR
	R458	QRD161J-474	RESISTOR
	R459	QRD161J-103	RESISTOR
	R460	QRD161J-102	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R461	QRD161J-103	RESISTOR
	R466	QRD161J-684	RESISTOR
	R467	QRD161J-564	RESISTOR
	R468	QRD161J-104	RESISTOR
	R469	QRD162J-683	RESISTOR
	R470	QRD161J-154	RESISTOR
	R471	QRD161J-564	RESISTOR
	R472	QVZ3518-224	V RESISTOR, SLOW TK PRESET(SP)
	R473	QRD161J-394	RESISTOR
	R474	QRD161J-124	RESISTOR
	R475	QRD161J-222	RESISTOR
	R485	QRD161J-123	RESISTOR
	R486	QRD161J-822	RESISTOR
	R487	QRD161J-222	RESISTOR
	R488	QRD161J-473	RESISTOR
	R489	QRG019J-331S	OMF.RESISTOR
	R490	QRD161J-562	RESISTOR
	R491	QRD161J-473	RESISTOR
	R492	QRD161J-105	RESISTOR
	R494	QRD161J-683	RESISTOR
	C401	QFV71HJ-124	M CAPACITOR
	C403	QCF31HP-102	CAPACITOR
	L401	PU59152-220	PEAKING COIL
	C421	QCC31CK-102	CAPACITOR
	C422	QEK61AM-226	E CAPACITOR
	C423	QEK61AM-226	E CAPACITOR
	C424	QCSB1HJ-150	CAPACITOR
	C426	QCXB1CN-272	CAPACITOR
	C427	QEK61HM-105	E CAPACITOR
	C428	QCC31CK-223	CAPACITOR
	C429	QCS31HJ-331	CAPACITOR
	C430	QCC31CK-102	CAPACITOR
	C431	QCC31CK-104	CAPACITOR
	C432	QEK61AM-226	E CAPACITOR
	C433	QCSB1HJ-220	CAPACITOR
	C434	QCC31CK-682	CAPACITOR
	C435	QFV71HJ-334	M CAPACITOR
	C436	QETC1EM-475	E CAPACITOR
	C437	QETC1EM-475	E CAPACITOR
	C438	QETC1EM-106	E CAPACITOR
	C439	QETC1EM-106	E CAPACITOR
	C440	QEN61HM-225	NP E CAPACITOR
	C441	QCC31CK-104	CAPACITOR
	C442	QCS31HJ-101	CAPACITOR
	C443	QFN31HJ-682	M CAPACITOR
	C444	QEK61HM-105	E CAPACITOR
	C445	QEK61AM-226	E CAPACITOR
	C446	QCBB1HJ-101	CAPACITOR
	C447	QCC31CK-102	CAPACITOR
	C448	QCC31CK-103	CAPACITOR
	C449	QCC31CK-473	CAPACITOR
	C450	QCF11HP-473	CAPACITOR
	C451	QCSB1HJ-680	CAPACITOR
	C461	QEK61AM-226	E CAPACITOR
	C463	QFV71HJ-104	M CAPACITOR
	C464	QFV71HJ-474	M CAPACITOR
	C465	QFN31HJ-393	M CAPACITOR
	C466	QFV71HJ-393	M CAPACITOR
	C467	QCBB1HJ-681	CAPACITOR
	C468	QCBB1HJ-471	CAPACITOR
	C471	QCC11CK-102	CAPACITOR
⚠	CF461	PU60215	RESONATOR

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TH421	NTH5D223KA	THERMISTOR
	OR	NTH5D223LA	THERMISTOR
	TP	PU57545	TEST PIN, X4
	CN401	PU58844-5	CAP HOUSING
	CN402	PU58844-3	CAP HOUSING
	CN403	PU58844-2Y	CAP HOUSING
	CN405	PU58844-4	CAP HOUSING
	CN409	PU58844-2	CAP HOUSING

-SERVO SUB BOARD ASSEMBLY-

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB40037A	SERVO SUB BOARD ASS'Y
	Q1	DTC124ES	TRANSISTOR
	Q2	DTA124ES	TRANSISTOR
	Q3	DTC124TS	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	1SS133	DIODE
	D4	1SS133	DIODE
	R1	QRD161J-272	RESISTOR
	R2	QRD161J-472	RESISTOR
	R3	QRD161J-104	RESISTOR

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8. MECHACON BOARD ASSEMBLY <04>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20123F	MECHANISM CONTROL BOARD ASS'Y
	TP	PU59391	STYLE PIN
⚠	IC1	M50938-611SP	IC
	IC2	BA6259N	IC
⚠	IC3	M54647L	IC
	IC4	BA6222	IC
	IC5	M50255P	IC
	Q1	2SC1740S(RS)	TRANSISTOR
	Q9	2SK656	FE TRANSISTOR
	D1	HZS4.3EB2	ZENER DIODE
	D2	MA165	DIODE
	OR	1SS133	DIODE
	D3	MA165	DIODE
	OR	1SS133	DIODE
	D4	MA165	DIODE
	OR	1SS133	DIODE
	D5	HZS7.5EB2	ZENER DIODE
	D6	MA165	DIODE
	OR	1SS133	DIODE
	DA1	DAP209S	DIODE
	OR	DAP201	DIODE
	R1	QRD161J-152	RESISTOR
	R2	QRD161J-332	RESISTOR
	R3	QRD161J-122	RESISTOR
	R4	QRD161J-823	RESISTOR
	R5	QRD161J-102	RESISTOR
	R6	QRD161J-102	RESISTOR
	R7	QRD161J-102	RESISTOR
	R8	QRD161J-103	RESISTOR
	R9	QRD161J-472	RESISTOR
	R10	QRD161J-105	RESISTOR
	R11	QRD161J-472	RESISTOR
	R12	QRD161J-472	RESISTOR
	R13	QRD161J-472	RESISTOR
	R14	QRD161J-472	RESISTOR
	R15	QRD161J-472	RESISTOR
	R16	QRD161J-472	RESISTOR
	R17	QRD161J-472	RESISTOR
	R18	QRD161J-472	RESISTOR
	R19	QRD161J-472	RESISTOR
	R20	QRD161J-472	RESISTOR
	R21	QRD161J-472	RESISTOR
	R22	QRD161J-472	RESISTOR
	R23	QRD161J-472	RESISTOR
	R24	QRD161J-472	RESISTOR
	R25	QRD161J-472	RESISTOR
	R26	QRD161J-124	RESISTOR
	R27	QRD161J-124	RESISTOR
	R28	QRD161J-333	RESISTOR
	R29	QRD161J-101	RESISTOR
	R30	QRD161J-822	RESISTOR
	R31	QRD161J-103	RESISTOR
	R32	QRD161J-821	RESISTOR
	R34	QRD161J-472	RESISTOR
	R35	QRD161J-472	RESISTOR
	R36	QRD161J-333	RESISTOR
	R37	QRD161J-333	RESISTOR
	R38	QRD161J-331	RESISTOR
	R40	QRD161J-103	RESISTOR
	R41	QRD161J-103	RESISTOR
	R42	QRD161J-103	RESISTOR
	R48	QRD161J-223	RESISTOR
	RA1	QRB037J-103	RESISTOR ARRAY
	RA2	QRB049J-472	RESISTOR ARRAY
	RA3	QRB049J-103	RESISTOR ARRAY
	C1	QCFB1EZ-223	CAPACITOR
	C2	QETC1EM-335	E CAPACITOR
	C3	QCFB1EZ-223	CAPACITOR
	C4	QETC1HM-105	E CAPACITOR
	C5	QETC1EM-106	E CAPACITOR
	C6	QETC1EM-106	E CAPACITOR
	C8	QETC1EM-475	E CAPACITOR
	C10	QCC11EJ-104	CAPACITOR
	C13	QEK41HM-474	E CAPACITOR
	C14	QCF11EZ-223	CAPACITOR
	CF1	PU60414	CERAMIC FILTER
⚠	HS1	PU60158	HEAT SINK
	SCW1	SBSE3006Z	TAPPING SCREW, X2
	SCW2	SBSE3008Z	TAPPING SCREW
	WR1	PW30112-L0AF6AH	PARALLEL WIRE
	CN1	PU59934-17	WIRE HOLDER
	CN2	PU58844-6	CAP HOUSING
	CN3	PU58844-6	CAP HOUSING
	CN4	PU60417-11	CAP HOUSING
	CN5	PU60417-8	CAP HOUSING
	CN6	PU58844-4	CAP HOUSING
	CN7	PU60417-9	CAP HOUSING
	CN8	PU58844-3	CAP HOUSING
	CN9	PU58844-3R	CAP HOUSING
	CN10	PU60417-8	CAP HOUSING
	CN11	PU58844-3	CAP HOUSING
	CN12	PU58844-3	CAP HOUSING
	CN13	PU59555-2	CAP HOUSING

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN14	PU58844-2	CAP HOUSING
	CN16	PU60417-8	CAP HOUSING
	CN17	PU58844-2	CAP HOUSING
	CN18	PU58844-3	CAP HOUSING
	CP1	ICP-F20	CIRCUIT PROTECT

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9. TERMINAL BOARD ASSEMBLY <06>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20179E-02	TERM. BOARD ASS'Y
⚠	RF1	PU60399	RF CONVERTER/SWITCH
	R1	QRD162J-750	RESISTOR
	R2	QRD162J-750	RESISTOR
	R3	QRD162J-750	RESISTOR
	R5	QRD162J-182	RESISTOR
	R6	QRD162J-182	RESISTOR
	CL1	PU59311-2	WIRE CLAMP
	SCW1	SDSF3008Z	TAPPING SCREW, X2
⚠	TML1	PU60280-5	TERMINAL BOARD
	WR1	PW30401-AB22T	COAXIAL CORD

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10. IF BOARD ASSEMBLY <07>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB10087B	IF BOARD ASS'Y
	JP1	PU59935-16	TERMINAL
⚠	IC1	M51365SP	IC
	Q1	2SC3354	TRANSISTOR
	Q2	2SC3354	TRANSISTOR
⚠	Q3	2SC1317(RS)	TRANSISTOR
	Q4	2SC536SPA(FG)	TRANSISTOR
		OR 2SC3311A(RS)	TRANSISTOR
	Q5	2SC536SPA(G)	TRANSISTOR
		OR 2SC3311A(S)	TRANSISTOR
	Q6	2SA1309S	TRANSISTOR
	Q7	2SC536SPA(G)	TRANSISTOR
		OR 2SC3311A(S)	TRANSISTOR
	Q10	2SC3354	TRANSISTOR
	D1	MTZ10D	ZENER DIODE
	D6	1SS133	DIODE
	D7	1SS133	DIODE
	D8	1SS133	DIODE
	R3	NRD718J-331NBU	RESISTOR
	R4	NRD718J-472NBU	RESISTOR
	R5	NRD718J-151NBU	RESISTOR
	R6	NRD718J-102NBU	RESISTOR
	R7	NRD718J-471NBU	RESISTOR
	R8	NRD718J-561NYU	RESISTOR
	R9	NRD718J-331NBU	RESISTOR
	R10	NRD718J-470NBU	RESISTOR
	R11	NRD718J-220NBU	RESISTOR
	R17	NRD718J-562NBU	RESISTOR
	R18	NRD718J-332NBU	RESISTOR
	R19	NRD718J-222NBU	RESISTOR
	R20	NRD718J-222NBU	RESISTOR
	R21	QVZ3518-472	V RESISTOR, RF AGC
	R22	NRD718J-824NBU	RESISTOR
	R24	NRD718J-102NBU	RESISTOR
	R25	NRD718J-821NBU	RESISTOR
	R26	NRD718J-104NBU	RESISTOR
	R27	NRD718J-104NBU	RESISTOR
	R28	NRD718J-104NBU	RESISTOR
	R31	NRD718J-222NBU	RESISTOR
	R33	NRD718J-223NBU	RESISTOR
	R34	NRD718J-470NBU	RESISTOR
	R35	NRD718J-561NBU	RESISTOR
	R36	NRD718J-561NBU	RESISTOR
	R37	NRD718J-391NBU	RESISTOR
	R38	NRD718J-152NBU	RESISTOR
	R39	NRD718J-152NBU	RESISTOR
	R40	QVZ3518-682	V RESISTOR, COLOR LEVEL
	R41	NRD718J-471NBU	RESISTOR
	R45	NRD718J-471NBU	RESISTOR
	R46	NRD718J-104NBU	RESISTOR
	R47	NRD718J-103NBU	RESISTOR
	R48	NRD718J-562NBU	RESISTOR
	R49	NRD718J-103NBU	RESISTOR
	R50	NRD718J-471NBU	RESISTOR
	R51	NRD718J-223NBU	RESISTOR
	R52	NRD718J-223NBU	RESISTOR
	R53	NRD718J-103NBU	RESISTOR
	R54	NRD718J-562NBU	RESISTOR
	R57	NRD718J-123NBU	RESISTOR
	R60	NRD718J-680NBU	RESISTOR
	R61	NRD718J-331NBU	RESISTOR
	R62	NRD718J-472NBU	RESISTOR
	R63	NRD718J-101NBU	RESISTOR
	R64	NRD718J-561NBU	RESISTOR
	R65	NRD718J-151NBU	RESISTOR
	R66	NRD718J-470NYU	RESISTOR
	R71	QRD161J-271	RESISTOR
	C2	NCT02CH-3R3NBR	CAPACITOR
	C3	QCT25CH-750	CAPACITOR
	C4	NCT02CH-3R3NBR	CAPACITOR
	C5	NCB71HK-102NBR	CAPACITOR
	C6	NCB71HK-102NBR	CAPACITOR
	C7	NCB71HK-102NBR	CAPACITOR
	C8	NCB71HK-102NBR	CAPACITOR
	C9	NCB71HK-102NBR	CAPACITOR
	C10	QETC1CM-336	E CAPACITOR
	C11	NCY71CM-103NBR	CAPACITOR
	C13	NCY71CM-103NBR	CAPACITOR
	C14	PU57601-474ME	E CAPACITOR
	C15	QETC1CM-336	E CAPACITOR
	C16	NCF71EZ-223NBR	CAPACITOR
	C17	NCF71EZ-223NBR	CAPACITOR
	C18	QFV71HJ-104	M CAPACITOR
	C19	NCB71HK-102NBR	CAPACITOR
	C20	NCY71CM-103NBR	CAPACITOR
	C21	NCB71HK-101NBR	CAPACITOR
	C22	QETC1HM-105	E CAPACITOR
	C24	QETC1HM-105	E CAPACITOR
	C25	NCB71HK-102NBR	CAPACITOR
	C26	QFN31HJ-123	M CAPACITOR
	C27	QETC1HM-474	E CAPACITOR
	C28	NCT02CH-100NBR	CAPACITOR

⚠ REF NO.	PART NO.	PART NAME, DESCRIPTION
C29	NCS71HJ-330NBR	CAPACITOR
C30	NCY71CM-103NBR	CAPACITOR
C31	QETC1HM-335	E CAPACITOR
C32	NCF71EZ-223NBR	CAPACITOR
C33	QETC1HM-474	E CAPACITOR
C39	NCB71HK-102NYR	CAPACITOR
C41	NCB71HK-102NBR	CAPACITOR
C42	QCT25CH-680	CAPACITOR
C43	NCB71HK-102NBR	CAPACITOR
C44	NCT02CH-1R0NYR	CAPACITOR
C45	QCT25HH-121	CAPACITOR
C46	NCT02CH-5R6NBR	CAPACITOR
C50	QETC1CM-336	E CAPACITOR
L2	PU60025-R68	PEAKING COIL, 0.68 MICRO
L3	PU60025-1R0	PEAKING COIL, 1 MICRO
L4	PU54223-180K	PEAKING COIL, 18 MICRO
L5	PU54223-270J	PEAKING COIL, 27 MICRO
L6	PU54223-470J	PEAKING COIL, 47 MICRO
CF1	PU58558-Z	CERAMIC FILTER
CF3	PU59039-Z	CERAMIC FILTER
SAW1	PU36386-3	SAW FILTER
T1	PU60042-2	COIL
T2	PU60027-01-01	IF.TRANSFORMER, VCO
T3	PU60028	IF.TRANSFORMER, AFC
T4	PU60104	IF.TRANSFORMER
T5	PU55184	IF.TRANSFORMER
T6	PU60548	COIL
T7	PU60258-2	COIL
T8	PU60264	COIL(2FH)

11. TUNER CONTROL BOARD ASSEMBLY <08>

#/⚠ REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	PB10003S	TUNER CTL BOARD ASS'Y
⚠ TNR1	PU36419-2	TUNER
IC1	TD6358P	IC
Q1	2SC3311A(S)	TRANSISTOR
OR	2SC1740S(S)	TRANSISTOR
⚠ Q3	2SC1317(S)	TRANSISTOR
Q5	UN4319VI	TRANSISTOR
Q6	UN4319VI	TRANSISTOR
Q7	UN4319VI	TRANSISTOR
Q8	UN4319VI	TRANSISTOR
Q13	2SC3399	TRANSISTOR
OR	DTC144ES	TRANSISTOR
D1	HZ30-2	ZENER DIODE
D2	E-452-2	DIODE
D4	1SS136	DIODE
D5	1SS133	DIODE
R1	NRD718J-333NBU	RESISTOR
R2	NRD718J-153NBU	RESISTOR
R3	NRD718J-121NBU	RESISTOR
R7	NRD718J-221NBU	RESISTOR
R14	NRD718J-102NBU	RESISTOR
R15	NRD718J-102NBU	RESISTOR
R16	NRD718J-102NBU	RESISTOR
R19	NRD718J-102NBU	RESISTOR
R22	NRD718J-184NBU	RESISTOR
R51	NRD718J-103NBU	RESISTOR
R52	NRD718J-103NBU	RESISTOR
R55	QRD161J-750	RESISTOR
C1	QFN31HK-223	M CAPACITOR
C2	QFV71HJ-474	M CAPACITOR
OR	QFZ9011-474Z	MM CAPACITOR
C3	QETC1HM-106	E CAPACITOR
C4	QETC1CM-106	E CAPACITOR
C5	QETC1CM-336	E CAPACITOR
C7	NCS71HJ-270NBR	CAPACITOR
C8	NCS71HJ-270NBR	CAPACITOR
C9	NCY71CM-103NBR	CAPACITOR
C10	NCY71CM-103NBR	CAPACITOR
C11	NCY71CM-103NBR	CAPACITOR
C13	NCY71CM-103NBR	CAPACITOR
C14	NCY71CM-103NBR	CAPACITOR
C15	QEK61AM-336	E CAPACITOR
C16	NCY71CM-103NBR	CAPACITOR
C30	QETC1HM-225	E CAPACITOR
C40	QCF11HP-103	CAPACITOR
C43	QCBB1HJ-102	CAPACITOR
C45	QCBB1HJ-102	CAPACITOR
⚠ X1	PU60029	CRYSTAL RESONATOR
HD1	PQ32168-1-3	HOLDER
SLD1	PU36374-01-01	SHIELD CASE
SLD2	PU36375	SHILD COVER
SLD3	PU36376	SHILD PLATE
CN1	PU58844-2	CAP HOUSING
CN2	PU58844-4	CAP HOUSING
CN3	PU60417-6	CAP HOUSING
CN5	PU58844-3	CAP HOUSING

12. AUDIO BOARD ASSEMBLY <09>

#/⚠ REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	PB20124C-01	AUDIO BOARD ASS'Y
IC1	AN3380NK	IC
IC2	TA7361AP	IC
IC3	PB20167B	FMA MODULE
⚠ IC101	UPC78N05	IC
Q1	DTC144ES	TRANSISTOR
Q2	2SC3311(RS)	TRANSISTOR
Q3	DTC144ES	TRANSISTOR
Q4	2SC1740S(RS)	TRANSISTOR
Q5	DTC124ES	TRANSISTOR
Q6	DTC124ES	TRANSISTOR
Q7	DTC124ES	TRANSISTOR
Q8	DTA114ES	TRANSISTOR
Q9	DTA114ES	TRANSISTOR
Q10	2SC1740S(RS)	TRANSISTOR
Q11	DTC143TS	TRANSISTOR
Q12	DTC143TS	TRANSISTOR
Q13	DTC143TS	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q16	DTA114ES	TRANSISTOR
	Q17	DTA114ES	TRANSISTOR
	Q18	2SC3311(RS)	TRANSISTOR
	Q22	DTC143TS	TRANSISTOR
	Q23	2SC1740S(RS)	TRANSISTOR
	Q24	2SC1740S(RS)	TRANSISTOR
	Q26	DTA114ES	TRANSISTOR
	Q27	DTA114ES	TRANSISTOR
	Q29	DTC124ES	TRANSISTOR
	Q31	2SD1468S(RS)	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D4	1SS133	DIODE
		OR MA165	DIODE
	D5	1SS133	DIODE
		OR MA165	DIODE
	D6	1SS133	DIODE
		OR MA165	DIODE
	D7	1SS133	DIODE
		OR MA165	DIODE
	D8	1SS133	DIODE
		OR MA165	DIODE
	D9	HZ2BLL	ZENER DIODE
	D10	1SS133	DIODE
		OR MA165	DIODE
	D11	1SS133	DIODE
		OR MA165	DIODE
	D12	1SS133	DIODE
		OR MA165	DIODE
	D14	1SS133	DIODE
		OR MA165	DIODE
	D15	1SS133	DIODE
		OR MA165	DIODE
	D16	HZ5A2	ZENER DIODE
	D20	1SS133	DIODE
		OR MA165	DIODE
	D21	1SS133	DIODE
		OR MA165	DIODE
	D22	1SS133	DIODE
		OR MA165	DIODE
	D24	1SS133	DIODE
		OR MA165	DIODE
	D25	1SS133	DIODE
		OR MA165	DIODE
	D26	1SS133	DIODE
		OR MA165	DIODE
	D27	1SS133	DIODE
		OR MA165	DIODE
	D28	1SS133	DIODE
		OR MA165	DIODE
	D29	1SS133	DIODE
		OR MA165	DIODE
	D33	DAN209S	DIODE
	D34	1SS133	DIODE
		OR MA165	DIODE
	D35	1SS133	DIODE
		OR MA165	DIODE
	D36	HZ4A1	ZENER DIODE
	R1	QRD161J-123	RESISTOR
	R2	QRD161J-153	RESISTOR
	R3	QRD161J-102	RESISTOR
	R4	QRD161J-682	RESISTOR
	R5	QRD161J-472	RESISTOR
	R6	QRD161J-152	RESISTOR
	R7	QRD161J-222	RESISTOR
	R8	QRD161J-100	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R9	QVZ3518-473	V RESISTOR, BIAS ADJ
	R10	QRD161J-102	RESISTOR
	R11	QRD162J-104	RESISTOR
	R12	QRD161J-102	RESISTOR
	R13	QRD161J-273	RESISTOR
	R14	QRD161J-3R9	RESISTOR
	R15	QRD161J-103	RESISTOR
	R16	QRD161J-562	RESISTOR
	R17	QRD181J-102	RESISTOR
	R19	QRD161J-103	RESISTOR
	R20	QRD161J-223	RESISTOR
	R21	QRD161J-151	RESISTOR
	R22	QRD161J-151	RESISTOR
	R23	QRD161J-243	RESISTOR
	R24	QRD161J-392	RESISTOR
	R25	QRD161J-103	RESISTOR
	R26	QRD161J-274	RESISTOR
	R27	QRD161J-391	RESISTOR
	R28	QVZ3518-102	V RESISTOR, PB LEVEL
	R31	QRD161J-103	RESISTOR
	R34	QRD161J-122	RESISTOR
	R36	QRD161J-182	RESISTOR
	R38	QRD161J-182	RESISTOR
	R40	QVZ3518-222	V RESISTOR, L CH E-E LEVEL
	R41	QVZ3518-222	V RESISTOR, R CH E-E LEVEL
	R42	QRD161J-333	RESISTOR
	R43	QRD161J-101	RESISTOR
	R44	QRD161J-101	RESISTOR
	R45	QRD161J-392	RESISTOR
	R46	QRD161J-332	RESISTOR
	R47	QRD161J-153	RESISTOR
	R48	QRD161J-223	RESISTOR
	R49	QRD161J-274	RESISTOR
	R50	QRD161J-222	RESISTOR
	R51	QRD161J-222	RESISTOR
	R52	QRD161J-103	RESISTOR
	R53	QRD162J-333	RESISTOR
	R54	QRD161J-183	RESISTOR
	R55	QRD161J-472	RESISTOR
	R56	QRD161J-152	RESISTOR
	R57	QRD161J-271	RESISTOR
	R58	QRD162J-333	RESISTOR
	R60	QRD161J-333	RESISTOR
	R61	QRD161J-333	RESISTOR
	R62	QRD161J-822	RESISTOR
	R65	QRD161J-223	RESISTOR
	R66	QRD161J-6R8	RESISTOR
	R67	QRD161J-103	RESISTOR
	R69	QVZ3518-331	V RESISTOR, REC FM LEVEL
	R70	QRD161J-273	RESISTOR
	R73	QRD161J-151	RESISTOR
	R74	QRD161J-151	RESISTOR
	R76	QRD161J-333	RESISTOR
	R77	QRD181J-223	RESISTOR
	R78	QRD161J-223	RESISTOR
	R79	QRD161J-820	RESISTOR
	R80	QRD161J-151	RESISTOR
	R81	QRD161J-223	RESISTOR
	R82	QRD162J-153	RESISTOR
	R83	QRD162J-103	RESISTOR
	R84	QRD161J-104	RESISTOR
	R85	QRD162J-102	RESISTOR
	R86	QRD161J-100	RESISTOR
	R87	QRD161J-104	RESISTOR
	R88	QRD161J-562	RESISTOR

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R91	QRD161J-331	RESISTOR
	C1	QEK61CM-106	E CAPACITOR
	C2	QETC1AM-476	E CAPACITOR
	C3	QEP61CM-106	NP E CAPACITOR
	C4	QETC1CM-106	E CAPACITOR
	C5	QETC1CM-226	E CAPACITOR
	C6	QETC1AM-336	E CAPACITOR
	C7	QETC1AM-476	E CAPACITOR
	C8	QCBB1HK-102	CAPACITOR
	C9	QCBB1HK-101	CAPACITOR
	C10	QETC1AM-336	E CAPACITOR
	C11	QETC1AM-107	E CAPACITOR
	C12	QETC1CM-226	E CAPACITOR
	C13	QETC1CM-106	E CAPACITOR
	C14	QEP61CM-106	NP E CAPACITOR
	C15	QETC1AM-476	E CAPACITOR
	C16	QETC1CM-106	E CAPACITOR
	C17	QCBB1HJ-331	CAPACITOR
	C18	QFV71HJ-223	M CAPACITOR
	C19	QCC11EJ-222	CAPACITOR
	C20	QCC11EJ-102	CAPACITOR
	C21	QEK61CM-106	E CAPACITOR
	C22	QETC1HM-225	E CAPACITOR
	C23	QFV71HJ-273	M CAPACITOR
	C24	QCBB1HK-102	CAPACITOR
	C25	QEK61HM-225	E CAPACITOR
	C26	QETC1AM-336	E CAPACITOR
	C27	QETB0JM-476	E CAPACITOR
	C28	QFV71HJ-823	M CAPACITOR
	C29	QFN31HJ-273	M CAPACITOR
	C30	QETC1CM-106	E CAPACITOR
	C31	QEP61HM-474	NP E CAPACITOR
	C32	QFN31HJ-103	M CAPACITOR
	C33	QFV71HJ-224	M CAPACITOR
	C34	QEB51CM-685	LL CAPACITOR
	C35	QEB51HM-105	LL CAPACITOR
	C36	QETC1CM-106	E CAPACITOR
	C37	QETC1CM-476	E CAPACITOR
	C38	QETC1CM-476	E CAPACITOR
	C39	QETC1HM-105	E CAPACITOR
	C40	QETB1CM-106	E CAPACITOR
	C43	QETC1CM-106	E CAPACITOR
	C45	QETC1HM-225	E CAPACITOR
	C46	QETB1HM-225	E CAPACITOR
	C47	QETC1HM-225	E CAPACITOR
	C49	QCF31HP-223	CAPACITOR
	C50	QFV71HJ-104	M CAPACITOR
	C51	QFV71HJ-104	M CAPACITOR
	C52	QFV71HJ-104	M CAPACITOR
	C53	QCF31HP-223	CAPACITOR
	C54	QETC1AM-107	E CAPACITOR
	C55	QCVB1CN-103	CAPACITOR
	C56	QCBB1HJ-102	CAPACITOR
	C57	QCSC1HJ-330	CAPACITOR
	C58	QCBB1HJ-331	CAPACITOR
	C59	QCBB1HJ-102	CAPACITOR
	C60	QCVB1CN-103	CAPACITOR
	C61	QCBB1HJ-102	CAPACITOR
	C62	QCVB1CN-103	CAPACITOR
	C63	QCC11EJ-272	CAPACITOR
	C64	QETC1CM-106	E CAPACITOR
	C66	QETC1HM-106	E CAPACITOR
	C67	QETB1CM-106	E CAPACITOR
	C72	QCBB1HK-561	CAPACITOR
	C73	QCBB1HK-561	CAPACITOR
	C74	QCC11EJ-332	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C75	QCC11EJ-102	CAPACITOR
	C76	QFV71HJ-333	M CAPACITOR
	C77	QETC1CM-106	E CAPACITOR
	C78	QCC11EJ-222	CAPACITOR
	C79	QFV71HJ-104	M CAPACITOR
	C81	QEP41HM-225	NP E CAPACITOR
	C103	QEK61HM-105	E CAPACITOR
	C104	QETC1CM-106	E CAPACITOR
	L1	PU53223-101J	PEAKING COIL, 100 MICRO
	L3	PU58308-472J	PEAKING COIL, 4.7M
	L4	PU54223-221J	PEAKING COIL, 220 MICRO
	L5	PU54223-101J	PEAKING COIL, 100 MICRO
	BPF1	PU60396	B.P.F.(1.3M)
	BPF2	PU60397	B.P.F.(1.7M)
⚠	T1	PU60320	OSC TRANS
⚠	T2	PU60321	OSC TRANSFORMER
	HN1	PU58018-1-2	PWB HINGE,X2
	HS1	PU60261	HEAT SINK
	RV1	PU52105	PLASTIC RIVET
	SLD1	PU59960	P/R AMP SHIELD1
	SLD2	PU59961	P/R AMP SHIELD2
	SLD3	PQ43345	SHIELD PLATE
	SPC1	PQM30029-44	SPACER
	TP	PU55774	TEST PIN, X8
	CN1	PU58844-4	CAP HOUSING
	CN2	PU60417-9	CAP HOUSING
	CN3	PU58844-4	CAP HOUSING
	CN4	PU58844-2	CAP HOUSING
	CN5	PU58844-5	CAP HOUSING
	CN6	PU58844-4	CAP HOUSING
	CN7	PU58844-6	CAP HOUSING
	CN8	PU58844-3	CAP HOUSING
	CN9	PU58844-2	CAP HOUSING
	CN10	PU60417-7	CAP HOUSING
	CN11	PU58844-2	CAP HOUSING

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13. AUDIO IN/OUT BOARD ASSEMBLY <10>

REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	PB20113B	AUD. I/O BOARD ASS'Y
IC1	M5218P	IC
IC2	BA7057	IC
IC3	AN3926K	IC
IC4	AN3926K	IC
IC5	UPD4053BC	IC
IC6	M5218P	IC
IC7	M50601P	IC
Q1	2SD1450S,T	TRANSISTOR
Q2	2SC1740S(QRS)	TRANSISTOR
Q3	DTC144ES	TRANSISTOR
Q4	DTC144ES	TRANSISTOR

#,⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q11	2SC1740S(QRS)	TRANSISTOR
	Q12	2SC1741S(QR)	TRANSISTOR
	D1	1SS133	DIODE
		OR MA165	DIODE
	D5	HZ6A3	DIODE
	R1	QRD161J-472	RESISTOR
	R2	QRD161J-682	RESISTOR
	R3	QRD161J-682	RESISTOR
	R4	QRD161J-472	RESISTOR
	R5	QRD161J-122	RESISTOR
	R6	QRD161J-273	RESISTOR
	R7	QRD161J-473	RESISTOR
	R8	QRD161J-473	RESISTOR
	R9	QRD161J-273	RESISTOR
	R10	QRD161J-683	RESISTOR
	R11	QRD161J-473	RESISTOR
	R12	QRD161J-561	RESISTOR
	R13	QRD161J-103	RESISTOR
	R14	QVZ3244-152	V RESISTOR, R CH LEVEL IND ADJ
	R15	QVZ3244-152	V RESISTOR, L CH LEVEL IND ADJ
	R16	QRD161J-222	RESISTOR
	R17	QRD161J-222	RESISTOR
	R18	QRD161J-562	RESISTOR
	R19	QRD161J-683	RESISTOR
	R20	QRD161J-823	RESISTOR
	R21	QRD161J-102	RESISTOR
	R22	QRD161J-102	RESISTOR
	R23	QRD161J-102	RESISTOR
	R24	QRD161J-102	RESISTOR
	R25	QRD161J-105	RESISTOR
	R26	QRD161J-105	RESISTOR
	R28	QRD161J-683	RESISTOR
	R29	QRD161J-122	RESISTOR
	R30	QRD161J-102	RESISTOR
	R31	QRD161J-102	RESISTOR
	R32	QRD161J-122	RESISTOR
	R34	QRD161J-333	RESISTOR
	R35	QRD161J-103	RESISTOR
	R36	QRD161J-103	RESISTOR
	R37	QRD161J-102	RESISTOR
	R38	QRD161J-151	RESISTOR
	R39	QRD161J-151	RESISTOR
	R40	QRD161J-102	RESISTOR
	R41	QRD161J-333	RESISTOR
	R42	QRD161J-153	RESISTOR
	R43	QRD161J-473	RESISTOR
	R44	QRD161J-153	RESISTOR
	R48	QRD161J-103	RESISTOR
	R49	QRD161J-102	RESISTOR
	R50	QRD161J-221	RESISTOR
	R51	QRD161J-221	RESISTOR
	R52	QRD161J-103	RESISTOR
	R53	QRD161J-103	RESISTOR
	R54	QRD161J-333	RESISTOR
	R55	QRD161J-333	RESISTOR
	R56	QRD161J-104	RESISTOR
	R59	QRD161J-102	RESISTOR
	R60	QRD161J-272	RESISTOR
	R61	QRD161J-332	RESISTOR
	R62	QRD161J-103	RESISTOR
	R63	QRD161J-472	RESISTOR
	R64	QRD161J-103	RESISTOR
	R65	QRD161J-102	RESISTOR
	R66	QRD161J-102	RESISTOR
	R68	QRD161J-273	RESISTOR
	R69	QRD161J-104	RESISTOR

#,⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R70	QRD161J-473	RESISTOR
	R71	QRD161J-333	RESISTOR
	R73	QRD161J-101	RESISTOR
	R74	QRD161J-103	RESISTOR
	R75	QRD161J-392	RESISTOR
	R76	QRD161J-103	RESISTOR
	R77	QRD161J-392	RESISTOR
	R78	QRD161J-472	RESISTOR
	R80	QRD161J-563	RESISTOR
	RA1	RGLD4X563J	REGISTOR ARRAY
	RA2	RGLD4X563J	REGISTOR ARRAY
	RA3	RGLD4X563J	REGISTOR ARRAY
	RA4	RGLD5X563J	REGISTOR ARRAY
	C1	QEK61CM-106	E CAPACITOR
	C2	QEK61CM-106	E CAPACITOR
	C3	QEK61CM-476	E CAPACITOR
	C4	QEK61CM-106	E CAPACITOR
	C5	QEK61CM-106	E CAPACITOR
	C6	QEK61CM-106	E CAPACITOR
	C7	QEK61CM-106	E CAPACITOR
	C8	QEK61HM-105	E CAPACITOR
	C9	QEK61HM-225	E CAPACITOR
	C10	QEK61HM-225	E CAPACITOR
	C11	QEP61CM-106	NP E CAPACITOR
	C12	QEP61CM-106	NP E CAPACITOR
	C13	QEK61CM-106	E CAPACITOR
	C14	QEK61CM-106	E CAPACITOR
	C15	QEK61CM-106	E CAPACITOR
	C16	QEK61CM-106	E CAPACITOR
	C17	QEK61CM-106	E CAPACITOR
	C18	QEK61CM-106	E CAPACITOR
	C19	QEK60JM-476	E CAPACITOR
	C20	QEK61CM-106	E CAPACITOR
	C21	QEP61CM-106	NP E CAPACITOR
	C22	QEP61CM-106	NP E CAPACITOR
	C23	QEP61CM-106	NP E CAPACITOR
	C24	QEK61CM-106	E CAPACITOR
	C25	QEK60JM-476	E CAPACITOR
	C26	QEK61CM-106	E CAPACITOR
	C27	QEK61CM-106	E CAPACITOR
	C28	QEK61CM-106	E CAPACITOR
	C29	QEP61CM-106	NP E CAPACITOR
	C30	QEK61CM-106	E CAPACITOR
	C31	QEK61CM-106	E CAPACITOR
	C32	QEK61CM-106	E CAPACITOR
	C33	QEK61CM-106	E CAPACITOR
	C34	QEP61CM-106	NP E CAPACITOR
	C35	QEP61CM-106	NP E CAPACITOR
	C36	QEP61CM-106	NP E CAPACITOR
	C37	QEP61CM-106	NP E CAPACITOR
	C38	QEK60JM-476	E CAPACITOR
	C39	QEK61CM-106	E CAPACITOR
	C40	QEK61CM-106	E CAPACITOR
	C41	QEK61CM-106	E CAPACITOR
	C42	QCBB1HJ-102	CAPACITOR
	C43	QEK41HM-105	E CAPACITOR
	C44	QCBB1HJ-101	CAPACITOR
	C45	QCBB1HJ-101	CAPACITOR
	C46	QEK61CM-106	E CAPACITOR
	C47	QCBB1HJ-391	CAPACITOR
	C48	QEK61CM-106	E CAPACITOR
	C49	QEP61CM-106	NP E CAPACITOR
	C50	QCBB1HJ-101	CAPACITOR
	C51	QCBB1HJ-101	CAPACITOR
	C52	QCVB1CN-103	CAPACITOR
	C53	QCVB1CN-103	CAPACITOR

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C54	QEK61CM-476	E CAPACITOR
	C55	QEK61CM-476	E CAPACITOR
	C56	QEK61HM-105	E CAPACITOR
	C57	QEK61HM-225	E CAPACITOR
	C58	QEK61HM-475	E CAPACITOR
	C59	QEK61CM-106	E CAPACITOR
	C60	QEK61CM-106	E CAPACITOR
	C61	QEK61CM-106	E CAPACITOR
	C62	QEK40JM-336	E CAPACITOR
	L1	PU53223-101J	PEAKING COIL, 100 MICRO
	L2	PU53223-101J	PEAKING COIL, 100 MICRO
⚠	CF1	PU51190	RESONATOR
	SLD1	PQ42994	SHIELD PLATE
	SLD2	PQ42995	SHIELD CASE
	SLD3	PQ43207	SHIELD COVER
	CN1	PU58844-4	CAP HOUSING
	CN2	PU58844-2	CAP HOUSING
	CN3	PU58844-3	CAP HOUSING
	CN4	PU58844-6	CAP HOUSING
	CN5	PU58844-3	CAP HOUSING
	CN6	PU58844-6	CAP HOUSING
	CN8	PU58844-2	CAP HOUSING
	CN9	PU58844-3	CAP HOUSING
	CN10	PU58844-3	CAP HOUSING
	CN11	PU58844-5	CAP HOUSING
	CN12	PU58844-5	CAP HOUSING

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14. AUDIO/CONTROL HEAD BOARD <12>

REF NO.	PART NO.	PART NAME, DESCRIPTION
PWB1	PU57643-1-2	AUDIO/CTL HEAD BOARD
BKT1	PQ43014	BRACKET
SCW1	SPSH1740	MINI SCREW
CN1	PU54537-5	CAP HOUSING
CN2	PU54537-2	CAP HOUSING

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15. DEMODULATOR BOARD ASSEMBLY <14>

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20129B	DEMOD BOARD ASS'Y
	IC1	CX20112	IC
	IC2	CXA1011P	IC
	IC3	CXA1011P	IC
	IC4	M5239L	IC
	Q1	2SD1468S(SE)	TRANSISTOR
	Q2	2SD1468S(SE)	TRANSISTOR
	Q3	2SD1468S(SE)	TRANSISTOR
	Q4	DTA114ES	TRANSISTOR
	Q5	DTA144WS	TRANSISTOR
⚠	Q7	2SD1450S,T	TRANSISTOR
	Q8	2SC1740S(RS)	TRANSISTOR
	Q9	2SC1740S(RS)	TRANSISTOR
	Q10	2SC1740S(RS)	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	D1	MTZ10D	ZENER DIODE
	D2	MTZ6.8B	ZENER DIODE
	D3	1SS133	DIODE
	D4	1SS133	DIODE
	D5	1SS133	DIODE
	D8	1SS133	DIODE
	D9	1SS133	DIODE
	D12	1SS133	DIODE
	D13	1SS133	DIODE
	D15	1SS133	DIODE
	D16	1SS133	DIODE
	R1	QRD161J-822	RESISTOR
	R2	QRV144F-1203A	C.M.F RESISTOR
	R3	QVZ3531-333	V RESISTOR,STEREO FILTER ADJ
	R4	QRV144F-1203A	C.M.F RESISTOR
	R5	QVZ3531-333	V RESISTOR,SAP FIL ADJ
	R6	QRD161J-154	RESISTOR
	R11	QRD161J-103	RESISTOR
	R13	QRD161J-471	RESISTOR
	R14	QRD161J-471	RESISTOR
	R15	QRD161J-103	RESISTOR
	R16	QRD161J-102	RESISTOR
	R17	QRD161J-102	RESISTOR
	R18	QVZ3518-472	V RESISTOR,SAP LEVEL
	R19	QVZ3518-103	V RESISTOR,SEPARATION
	R20	QRD161J-362	RESISTOR
	R21	QRD161J-224	RESISTOR
	R22	QVZ3518-104	V RESISTOR,OUTPUT LEVEL(L+R)
	R23	QVZ3531-332	V RESISTOR,STEREO VCO ADJ
	R24	QRD161J-332	RESISTOR
	R25	QRD161J-561	RESISTOR
	R26	QVZ3518-103	V RESISTOR,LEVEL (L-R)
	R27	QRV144F-5603A	C.M.F RESISTOR
	R28	QRV144F-2322A	C.M.F RESISTOR
	R29	QRD161J-222	RESISTOR
	R30	QRD161J-182	RESISTOR
	R31	QRD161J-473	RESISTOR
	R32	QRD161J-361	RESISTOR
	R33	QRD161J-301	RESISTOR
	R34	QRD161J-682	RESISTOR
	R35	QRD161J-752	RESISTOR
	R36	QVZ3518-682	V RESISTOR,SPECTRUM
	R37	QRV144F-5603A	C.M.F RESISTOR
	R38	QRV144F-2322A	C.M.F RESISTOR
	R39	QRD161J-272	RESISTOR
	R40	QRD161J-561	RESISTOR
	R41	QRD161J-153	RESISTOR
	R42	QRD161J-361	RESISTOR
	R43	QRD161J-682	RESISTOR
	R44	QRD161J-752	RESISTOR
	R45	QRD161J-272	RESISTOR
	R46	QRD161J-102	RESISTOR
	R47	QRD161J-102	RESISTOR
	R48	QRD161J-332	RESISTOR
	R49	QRD161J-332	RESISTOR
	R50	QRD161J-332	RESISTOR
	R53	QRD182J-271	RESISTOR
	R54	QRD161J-301	RESISTOR
	R55	QVZ3518-472	V RESISTOR,SAP LEVEL
	R56	QRD161J-683	RESISTOR
	R57	QRD161J-183	RESISTOR
	R58	QRD161J-221	RESISTOR
	R59	QRD161J-104	RESISTOR
	R60	QRD161J-104	RESISTOR
	R61	QRD161J-153	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R62	QRD161J-472	RESISTOR
	R63	QRD161J-125	RESISTOR
	R64	QRD161J-472	RESISTOR
	R65	QRD161J-392	RESISTOR
	R67	QRD161J-473	RESISTOR
	R70	QRD161J-103	RESISTOR
	R73	QRD161J-103	RESISTOR
	R74	QRD161J-103	RESISTOR
	R76	QRV144F-1002A	C.M.F RESISTOR
	R78	QRD161J-822	RESISTOR
	R79	QRD161J-102	RESISTOR
	C1	QEK61CM-106	E CAPACITOR
	C2	QCC11EK-473	CAPACITOR
	C3	QEK61CM-106	E CAPACITOR
	C4	QCC11EK-223	CAPACITOR
	C5	QEK61HM-105	E CAPACITOR
	C6	QEK61HM-105	E CAPACITOR
	C8	QFL31HJ-472	M CAPACITOR
	C10	QEK61CM-106	E CAPACITOR
	C11	QEK61CM-106	E CAPACITOR
	C12	QFV71HJ-223	M CAPACITOR
	C13	QEK61CM-106	E CAPACITOR
	C14	PU58285-182J	PP CAP, 1800P +5,-5% /50V
	C15	QEK61HM-105	E CAPACITOR
	C16	QEK61EM-475	E CAPACITOR
	C17	QEK61CM-106	E CAPACITOR
	C18	QEK61CM-106	E CAPACITOR
	C19	QEK61CM-106	E CAPACITOR
	C20	QEE81CJ-335	TA.CAP
	C21	QEK61HM-105	E CAPACITOR
	C22	QEE81CJ-106	TA.CAP
	C23	QEK61HM-225	E CAPACITOR
	C24	QEK61CM-106	E CAPACITOR
	C25	QETC1CM-107	E CAPACITOR
	C26	QFL31HJ-472	M CAPACITOR
	C27	QEK61HM-105	E CAPACITOR
	C28	QEN61CM-106	NP E CAPACITOR
	C29	QFV71HJ-223	M CAPACITOR
	C30	QFV71HJ-104	M CAPACITOR
	C31	QEK61HM-105	E CAPACITOR
	C32	QEK61CM-106	E CAPACITOR
	C33	QEE81CJ-335	TA.CAP
	C34	QEK61HM-105	E CAPACITOR
	C35	QEE81CJ-106	TA.CAP
	C36	QEK61HM-225	E CAPACITOR
	C37	QEK61CM-106	E CAPACITOR
	C38	QETC1CM-107	E CAPACITOR
	C39	QFL31HJ-152	M CAPACITOR
	C41	QEN61CM-106	NP E CAPACITOR
	C42	QFV71HJ-223	M CAPACITOR
	C43	QFV71HJ-104	M CAPACITOR
	C44	QEK61HM-105	E CAPACITOR
	C45	QEK61CM-106	E CAPACITOR
	C46	QCSB1HJ-220	CAPACITOR
	C47	QETC1CM-107	E CAPACITOR
	C48	QCVB1CN-103	CAPACITOR
	C49	QCBB1HJ-221	CAPACITOR
	C50	QEK61HM-105	E CAPACITOR
	C51	QFL31HJ-102	M CAPACITOR
	C52	QCBB1HJ-331	CAPACITOR
	C58	QFV71HJ-123	M CAPACITOR
	C59	QFV71HJ-123	M CAPACITOR
	L1	PU60036-821K	COIL, 820 MICRO
	L2	PU60211	L.P.FILTER
	L3	PU60211	L.P.FILTER
	L4	PU53223-1R0H	PEAKING COIL, 1 MICRO

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN1	PU58844-6	CAP HOUSING
	CN2	PU58844-3	CAP HOUSING
	CN3	PU58844-3	CAP HOUSING
	CN4	PU58844-2	CAP HOUSING

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16. DIGITAL BOARD ASSEMBLY <15>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB10099A-06	DIGITAL BOARD ASSY
	IC1	M51271FP	IC
	IC2	NJM2217L	IC
	IC3	M51272FP	IC
	IC4	M51279FP	IC
	IC5	NJM2217L	IC
	IC6	M50747-622FP	IC
	IC7	M65011FP-C	IC
	IC8	M52678FP	IC
	IC9	M52678FP	IC
	IC10	M5M4C500L-10	IC
	IC11	M5M4C500L-10	IC
	IC12	M5M4C500L-10	IC
	IC13	M52679FP	IC
	IC14	M52679FP	IC
	IC15	M52679FP	IC
	IC16	UPD74HC00G	IC
	IC17	TD62003F	IC
	IC18	TD62003F	IC
	IC19	UPC393C	IC
	IC20	TC74HC4053AF	IC
	IC21	TC74HC4053AF	IC
	IC22	TC74HC02F	IC
	IC23	TC74HC02F	IC
	Q1	2SC2412K(RS)	TRANSISTOR
	Q2	2SA1037K(RS)	TRANSISTOR
	Q3	2SA1037K(RS)	TRANSISTOR
	Q4	2SA1037K(RS)	TRANSISTOR
	Q5	2SA1037K(RS)	TRANSISTOR
	Q6	2SC2412K(RS)	TRANSISTOR
	Q7	2SA1037K(RS)	TRANSISTOR
	Q8	2SC2412K(RS)	TRANSISTOR
	Q9	2SC2412K(RS)	TRANSISTOR
	Q10	DTC144EK	TRANSISTOR
	Q11	2SC2412K(RS)	TRANSISTOR
	Q12	2SA1037K(RS)	TRANSISTOR
	D1	DAN202K	DIODE
	D2	DAP202K	DIODE
	D3	MA151WK	DIODE
	D4	MA151WK	DIODE
	D5	DAN202K	DIODE
	R1	QRSA08J-153YN	RESISTOR
	R2	QRSA08J-123YN	RESISTOR
	R3	QRSA08J-222YN	RESISTOR
	R4	QRSA08J-182YN	RESISTOR
	R5	QRSA08J-102YN	RESISTOR
	R6	QRSA08J-562YN	RESISTOR
	R7	QRSA08J-123YN	RESISTOR
	R8	QRSA08J-473YN	RESISTOR
	R9	QRSA08J-823YN	RESISTOR
	R10	QRSA08J-222YN	RESISTOR
	R11	QRSA08J-102YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R12	QRSA08J-102YN	RESISTOR
	R13	QRSA08J-102YN	RESISTOR
	R14	QRSA08J-102YN	RESISTOR
	R15	QRSA08J-562YN	RESISTOR
	R16	QRSA08J-562YN	RESISTOR
	R17	QRSA08J-183YN	RESISTOR
	R18	QRSA08J-333YN	RESISTOR
	R19	QRSA08J-153YN	RESISTOR
	R20	QVZ3513-473	V RESISTOR,COLOR LEVEL
	R21	QRSA08J-474YN	RESISTOR
	R22	QRSA08J-152YN	RESISTOR
	R23	QVZ3513-473	V RESISTOR,COLOR PHASE
	R24	QRSA08J-151YN	RESISTOR
	R25	QRSA08J-331YN	RESISTOR
	R26	QRSA08J-823YN	RESISTOR
	R27	QRSA08J-222YN	RESISTOR
	R28	QRSA08J-103YN	RESISTOR
	R29	QRSA08J-223YN	RESISTOR
	R30	QVZ3513-223	V RESISTOR,AFC
	R31	QRSA08J-222YN	RESISTOR
	R32	QRSA08J-105YN	RESISTOR
	R35	QRSA08J-471YN	RESISTOR
	R36	QVZ3513-103	V RESISTOR,COL DIFFERENCE BAL
	R37	QVZ3513-473	V RESISTOR,CARR BALANCE(1)
	R39	QRSA08J-822YN	RESISTOR
	R40	QRSA08J-333YN	RESISTOR
	R42	QRSA08J-102YN	RESISTOR
	R43	QRSA08J-362YN	RESISTOR
	R44	QRSA08J-123YN	RESISTOR
	R45	QRSA08J-472YN	RESISTOR
	R46	QRSA08J-471YN	RESISTOR
	R47	QRSA08J-272YN	RESISTOR
	R48	QVZ3513-472	V RESISTOR,BURST LEVEL
	R49	QVZ3513-473	V RESISTOR,CARR BARANCE(2)
	R50	QRSA08J-681YN	RESISTOR
	R51	QRSA08J-102YN	RESISTOR
	R52	QRSA08J-823YN	RESISTOR
	R53	QRSA08J-222YN	RESISTOR
	R54	QRSA08J-183YN	RESISTOR
	R55	QRSA08J-333YN	RESISTOR
	R56	QRSA08J-153YN	RESISTOR
	R57	QRSA08J-474YN	RESISTOR
	R58	QRSA08J-152YN	RESISTOR
	R59	QVZ3513-473	V RESISTOR,P IN P COLOR PHASE
	R60	QRSA08J-151YN	RESISTOR
	R61	QRSA08J-331YN	RESISTOR
	R62	QRSA08J-823YN	RESISTOR
	R63	QRSA08J-103YN	RESISTOR
	R64	QRSA08J-222YN	RESISTOR
	R65	QRSA08J-223YN	RESISTOR
	R66	QVZ3513-223	V RESISTOR,AFC
	R67	QRSA08J-222YN	RESISTOR
	R68	QRSA08J-105YN	RESISTOR
	R69	QRSA08J-103YN	RESISTOR
	R70	QRSA08J-103YN	RESISTOR
	R71	QRSA08J-102YN	RESISTOR
	R72	QRSA08J-331YN	RESISTOR
	R73	QVZ3513-102	V RESISTOR,COLOR
	R74	QRSA08J-105YN	RESISTOR
	R75	QRSA08J-103YN	RESISTOR
	R76	QRSA08J-105YN	RESISTOR
	R77	QRSA08J-102YN	RESISTOR
	R78	QRSA08J-183YN	RESISTOR
	R79	QRSA08J-472YN	RESISTOR
	R80	QRSA08J-822YN	RESISTOR
	R81	QRSA08J-392YN	RESISTOR
	R82	QRSA08J-562YN	RESISTOR
	R83	QRSA08J-103YN	RESISTOR
	R84	QRSA08J-333YN	RESISTOR
	R85	QRSA08J-113YN	RESISTOR
	R86	QRSA08J-472YN	RESISTOR
	R87	QRSA08J-104YN	RESISTOR
	R88	QRSA08J-184YN	RESISTOR
	R89	QRSA08J-472YN	RESISTOR
	R90	QRSA08J-472YN	RESISTOR
	R91	QRSA08J-562YN	RESISTOR
	R92	QRSA08J-122YN	RESISTOR
	R93	QRSA08J-152YN	RESISTOR
	R94	QRSA08J-331YN	RESISTOR
	R95	QRSA08J-332YN	RESISTOR
	R96	QRSA08J-122YN	RESISTOR
	R97	QRSA08J-471YN	RESISTOR
	R98	QRSA08J-152YN	RESISTOR
	R99	QRSA08J-105YN	RESISTOR
	R100	QRSA08J-105YN	RESISTOR
	R101	QRSA08J-561YN	RESISTOR
	R102	QRSA08J-561YN	RESISTOR
	R103	QRSA08J-331YN	RESISTOR
	R104	QRSA08J-102YN	RESISTOR
	R105	QRSA08J-222YN	RESISTOR
	R106	QRSA08J-822YN	RESISTOR
	R109	QRSA08J-103YN	RESISTOR
	R110	QRSA08J-332YN	RESISTOR
	R111	QRSA08J-103YN	RESISTOR
	R112	QRSA08J-105YN	RESISTOR
	R113	QRSA08J-105YN	RESISTOR
	R114	QRSA08J-821YN	RESISTOR
	R115	QRSA08J-471YN	RESISTOR
	R117	QRSA08J-471YN	RESISTOR
	R122	QRSA08J-562YN	RESISTOR
	R123	QRSA08J-222YN	RESISTOR
	R124	QRSA08J-222YN	RESISTOR
	R125	QRSA08J-102YN	RESISTOR
	R126	QRSA08J-223YN	RESISTOR
	R127	QRSA08J-103YN	RESISTOR
	R128	QRSA08J-183YN	RESISTOR
	R129	QRSA08J-684YN	RESISTOR
	R130	QRSA08J-684YN	RESISTOR
	R131	QRD161J-105	RESISTOR
	C1	QEK61HM-105	E CAPACITOR
	C2	QEF81CM-474	TANTAL CAPACITOR
	C3	QEK61HM-105	E CAPACITOR
	C4	QCFA1HZ-473	CAPACITOR
	C5	QEK61HM-474	E CAPACITOR
	C6	QCYA1HK-102	CAPACITOR
	C7	QCYA1HK-103	CAPACITOR
	C8	QEK61AM-336	E CAPACITOR
	C9	QCYA1HK-102	CAPACITOR
	C10	QCYA1HK-103	CAPACITOR
	C11	QCYA1HK-103	CAPACITOR
	C12	QEK61HM-105	E CAPACITOR
	C13	QCYA1HK-103	CAPACITOR
	C14	QEK61AM-336	E CAPACITOR
	C15	QCYA1HK-103	CAPACITOR
	C16	QEK61HM-105	E CAPACITOR
	C17	QCYA1HK-103	CAPACITOR
	C18	QCSA1HJ-150	CAPACITOR
	C19	PU57672-300	TRIMMER CAPACITOR, VCXO
	C20	QCSA1HJ-101	CAPACITOR
	C21	QCYA1HK-102	CAPACITOR
	C22	QEK61HM-105	E CAPACITOR
	C23	QCYA1HK-102	CAPACITOR
	C24	QEK61HM-224	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C25	QCFA1EZ-683	CAPACITOR
	C26	QEK61HM-105	E CAPACITOR
	C27	QCTA1CH-681	CAPACITOR
	C28	QEK61AM-336	E CAPACITOR
	C29	QCYA1HK-103	CAPACITOR
	C30	QCFA1EZ-104	CAPACITOR
	C31	QCYA1HK-103	CAPACITOR
	C32	QCFA1HZ-473	CAPACITOR
	C33	QEK61CM-106	E CAPACITOR
	C34	QCYA1HK-103	CAPACITOR
	C35	QCYA1HK-103	CAPACITOR
	C36	QEK61HM-105	E CAPACITOR
	C37	QEK61AM-107	E CAPACITOR
	C38	QCSA1HJ-8R0	CAPACITOR
	C39	QCSA1HJ-180	CAPACITOR
	C40	QCYA1HK-103	CAPACITOR
	C41	QCFA1HZ-473	CAPACITOR
	C42	QEK61CM-106	E CAPACITOR
	C43	QCYA1HK-103	CAPACITOR
	C44	QCYA1HK-103	CAPACITOR
	C45	QCYA1HK-103	CAPACITOR
	C46	QEK61AM-336	E CAPACITOR
	C47	QCYA1HK-103	CAPACITOR
	C48	QEK61AM-336	E CAPACITOR
	C49	QEK61HM-105	E CAPACITOR
	C50	QCFA1HZ-473	CAPACITOR
	C51	QCYA1HK-103	CAPACITOR
	C52	QEK61HM-105	E CAPACITOR
	C53	QEF81CM-474	TANTAL CAPACITOR
	C54	QEK61HM-105	E CAPACITOR
	C55	QCFA1HZ-473	CAPACITOR
	C56	QEK61HM-474	E CAPACITOR
	C57	QCYA1HK-103	CAPACITOR
	C58	QEK61AM-336	E CAPACITOR
	C59	QCYA1HK-102	CAPACITOR
	C60	QCYA1HK-103	CAPACITOR
	C61	QCYA1HK-103	CAPACITOR
	C62	QEK61HM-105	E CAPACITOR
	C63	QCYA1HK-103	CAPACITOR
	C64	QEK61AM-336	E CAPACITOR
	C65	QCYA1HK-103	CAPACITOR
	C66	QEK61HM-105	E CAPACITOR
	C67	QCYA1HK-103	CAPACITOR
	C68	QCSA1HJ-150	CAPACITOR
	C69	PU57672-300	TRIMMER CAPACITOR, VCXO
	C70	QCSA1HJ-101	CAPACITOR
	C71	QCYA1HK-102	CAPACITOR
	C72	QCFA1EZ-683	CAPACITOR
	C73	QEK61HM-105	E CAPACITOR
	C74	QCTA1CH-681	CAPACITOR
	C75	QCYA1HK-103	CAPACITOR
	C76	QEK61AM-336	E CAPACITOR
	C77	QCFA1EZ-104	CAPACITOR
	C78	QCTA1UJ-330	CAPACITOR
	C79	QCYA1HK-103	CAPACITOR
	C80	QCTA1UJ-330	CAPACITOR
	C81	QCYA1HK-103	CAPACITOR
	C82	QEK61EM-475	E CAPACITOR
	C83	QCTA1CH-7R0	CAPACITOR
	C84	QCTA1CH-7R0	CAPACITOR
	C85	QCYA1HK-103	CAPACITOR
	C86	QCYA1HK-103	CAPACITOR
	C87	QCYA1HK-102	CAPACITOR
	C88	QCYA1HK-103	CAPACITOR
	C89	QCYA1HK-103	CAPACITOR
	C90	QCSA1HJ-471	CAPACITOR
	C91	QEK61CM-106	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C92	QCYA1HK-472	CAPACITOR
	C93	QCYA1HK-103	CAPACITOR
	C94	QCYA1HK-103	CAPACITOR
	C95	QCYA1HK-103	CAPACITOR
	C96	QCYA1HK-103	CAPACITOR
	C97	QCSA1HJ-471	CAPACITOR
	C98	QEK61CM-106	E CAPACITOR
	C99	QCYA1HK-472	CAPACITOR
	C100	QCYA1HK-103	CAPACITOR
	C101	QCYA1HK-103	CAPACITOR
	C102	QCYA1HK-103	CAPACITOR
	C103	QCYA1HK-103	CAPACITOR
	C104	QCYA1HK-103	CAPACITOR
	C105	QCYA1HK-103	CAPACITOR
	C106	QEK60JM-107	E CAPACITOR
	C107	QCYA1HK-103	CAPACITOR
	C108	QEK60JM-107	E CAPACITOR
	C109	QCYA1HK-103	CAPACITOR
	C110	QEK60JM-107	E CAPACITOR
	C111	QCYA1HK-103	CAPACITOR
	C112	QCYA1HK-103	CAPACITOR
	C113	QCYA1HK-103	CAPACITOR
	C114	QCYA1HK-103	CAPACITOR
	C116	QEK61AM-336	E CAPACITOR
	C117	QEK61AM-336	E CAPACITOR
	C118	QER61AM-336	E CAPACITOR
	C119	QCYA1HK-103	CAPACITOR
	C120	QCTA1CH-470	CAPACITOR
	C121	QCTA1CH-101	CAPACITOR
	C123	QCYA1HK-103	CAPACITOR
	C124	QCYA1HK-103	CAPACITOR
	C125	QCSA1HJ-561	CAPACITOR
	C126	QCSA1HJ-561	CAPACITOR
	C127	QCYA1HK-103	CAPACITOR
	C129	QEF80JM-106	TANTAL CAPACITOR
	C131	QCYA1HK-103	CAPACITOR
	C132	QCTA1CH-271	CAPACITOR
	C133	QCTA1CH-470	CAPACITOR
	C134	QEF80JM-225	TANTAL CAPACITOR
	C137	QEK40JM-227	E CAPACITOR
	C138	QEK40JM-227	E CAPACITOR
	C139	QEE41AM-336	TANTAL CAPACITOR
	C140	QCS11HJ-220	CAPACITOR
	L1	PU60480-101J	COIL, 100 MICRO
	L2	PU60480-101J	COIL, 100 MICRO
	L3	PU60480-4R7K	COIL, 4.7 MICRO
	L4	PU60480-150J	COIL, 15 MICRO
	LPF1	PU60441	LOW PASS FILTER
	LPF2	PU60441	LOW PASS FILTER
	LPF3	PU60445	LOW PASS FILTER
	BPF1	PU60446-2	BAND PASS FILTER
⚠	CF1	PU60440	RESONATOR
	LC1	PU59736-223	N FILTER
	LC2	PU59736-223	N FILTER
	LC28	PU59736-223	N FILTER
	LC29	PU59736-223	N FILTER
	LC30	PU59736-223	N FILTER
	LC31	PU59736-223	N FILTER
	LC32	PU59736-223	N FILTER
	LC33	PU59736-223	N FILTER
	LC34	PU59736-223	N FILTER
	LC35	PU59736-223	N FILTER
	LC36	PU59736-223	N FILTER

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	LC37	PU59736-223	N FILTER
	LC38	PU59736-223	N FILTER
	LC39	PU59736-223	N FILTER
	LC40	PU59736-223	N FILTER
⚠	X1	PU60438	CRYSTAL RESONATOR
⚠	X2	PU60438	CRYSTAL RESONATOR
⚠	X3	PU60439	CRYSTAL RESONATOR
	TH1	ERT-D2ZFL102S	THERMISTOR
	CL1	PU49485-4	WIRE CLAMP, X2
	SCW1	SDST3006Z	TAPPING SCREW, X3
	SCW2	SDST3004Z	TAPPING SCREW
	SLD1	PQ32344-1-1	SHIELD FLAME
	SLD2	PQ32342-1-2	SHIELD FLAME
	SLD3	PQ32341-1-2	SHIELD FLAME
	SPC1	PQM30029-54	SPACER
	SHT1	PQ43349	SHEET, X3

-DIGITAL SUB BOARD ASSEMBLY-

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB40026A-02	DIGITAL SUB BOARD ASSY
	Q1	DTC144EF	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	1SS133	DIODE
	D4	MA27T(A)	DIODE
	R1	QRD162J-103	RESISTOR
	R2	QRD162J-103	RESISTOR
	R3	QRD162J-472	RESISTOR

-CNN BOARD ASSEMBLY-

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB40031A-01	CNN BOARD ASSY
	R1	QRD161J-102	RESISTOR
	R2	QRD161J-102	RESISTOR
	R3	QRD161J-471	RESISTOR
	R4	QRD161J-561	RESISTOR
	R5	QRD161J-471	RESISTOR
	R6	QRD161J-561	RESISTOR
	C1	QCZ0126-102	CAPACITOR
	C2	QCZ0126-102	CAPACITOR
	C3	QCZ0125-101	CAPACITOR
	C4	QCZ0125-101	CAPACITOR
	C5	QCZ0125-101	CAPACITOR
	C6	QCZ0125-101	CAPACITOR
	C7	QCZ0125-101	CAPACITOR
	C8	QCZ0125-101	CAPACITOR
	C9	QCZ0125-101	CAPACITOR
	C10	QCZ0125-101	CAPACITOR
	C11	QCZ0126-331	CAPACITOR
	C12	QCZ0126-331	CAPACITOR
	C13	QCZ0126-331	CAPACITOR
	C14	QCZ0126-331	CAPACITOR
	C15	QCZ0126-331	CAPACITOR
	C16	QCZ0126-331	CAPACITOR
	C17	QCZ0126-331	CAPACITOR
	C18	QCZ0126-331	CAPACITOR
	C19	QEK61HM-225	E CAPACITOR
	K1	PU60529	BEADS CORE, X18
	BKT1	PQ32343-1-1	BRACKET
	SCW1	SDST3006Z	TAPPING SCREW,X2

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	SCW2	SDST3005Z	TAPPING SCREW,X2
	SPC1	PQM30029-54	SPACER,X2
	CN1	PU58844-14	CAP HOUSING
	CN2	PU58844-9	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING

-CNN SUB BOARD ASSEMBLY-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB40032A-01	CNN SUB BOARD ASSY
	C1	QCZ0124-331	CAPACITOR
	C2	QCZ0124-331	CAPACITOR
	C3	QCZ0124-331	CAPACITOR
	C4	QCZ0124-331	CAPACITOR
	C5	QCZ0124-331	CAPACITOR
	C6	QCZ0124-331	CAPACITOR
	C7	QCZ0124-331	CAPACITOR
	C8	QCZ0124-331	CAPACITOR
	C9	QCZ0124-331	CAPACITOR
	C10	QCZ0124-331	CAPACITOR
	BKT1	PQ43392	BRACKET
	SPC1	PQM30029-111	SPACER,X2
	CN1	PU58844-2	CAP HOUSING
	CN2	PU59555-8	CAP HOUSING

-DIG SUB 2 BOARD ASSEMBLY-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20255A	DIG SUB 2 BOARD ASSY
	Q13	2SC2412K(RS)	TRANSISTOR
	Q14	2SC2412K(RS)	TRANSISTOR
	R132	QRSA08J-182YN	RESISTOR
	R133	QRSA08J-222YN	RESISTOR
	R134	QRSA08J-102YN	RESISTOR
	R135	QRSA08J-182YN	RESISTOR
	R136	QRSA08J-222YN	RESISTOR
	R137	QRSA08J-102YN	RESISTOR
	C135	QCYA1HK-102	CAPACITOR
	C136	QCYA1HK-102	CAPACITOR
	SPC1	PU59915-206	SPACER

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17. SIGNAL SELECT BOARD ASSEMBLY <16>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB30035D	SIG.SEL BOARD ASS'Y
	IC3	UPC7805H	IC
	C7	QETC1AM-107	E CAPACITOR
	C8	QCC31CJ-104	CAPACITOR
	C9	QETC1AM-107	E CAPACITOR
	C10	QCC31CJ-104	CAPACITOR
	C11	QCC31CJ-104	CAPACITOR
	C12	QCC31CJ-104	CAPACITOR
⚠	HS1	PQ43262	HEAT SINK
	SCW1	SDST3006Z	TAPPING SCREW
	SCW2	SDST3006Z	TAPPING SCREW

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN3	PU58844-3	CAP HOUSING
	CN5	PU58844-2	CAP HOUSING
	CN6	PU58844-2	CAP HOUSING
	CN7	PU58844-2	CAP HOUSING
	CN8	PU58844-2	CAP HOUSING
	CP1	ICP-F15	CIRCUIT PROTECT

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18. ON SCREEN BOARD ASSEMBLY <17>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20170B	ON SCREEN BOARD ASSY
	TP	PU56008	TEST-PIN, X3
	IC1	MB89010A-108	IC
	IC101	M50925-616SP	IC
	Q1	2SA1309R,S	TRANSISTOR
	Q3	2SA1309R,S	TRANSISTOR
	Q5	DTA124ES	TRANSISTOR
	Q7	DTC114ES	TRANSISTOR
	Q8	2SA933S(RS)	TRANSISTOR
	Q9	DTC114ES	TRANSISTOR
	D1	1SS133	DIODE
	D2	LTZ-MR15	LE DIODE
	R1	QRD161J-102	RESISTOR
	R2	QRD161J-102	RESISTOR
	R3	QRD161J-222	RESISTOR
	R4	QRD161J-222	RESISTOR
	R5	QRD161J-472	RESISTOR
	R6	QRD161J-102	RESISTOR
	R7	QRD161J-472	RESISTOR
	R8	QRD161J-472	RESISTOR
	R9	QRD161J-472	RESISTOR
	R10	QRD161J-472	RESISTOR
	R11	QRD161J-472	RESISTOR
	R14	QRD161J-471	RESISTOR
	R15	QRD161J-154	RESISTOR
	R17	QRD161J-104	RESISTOR
	R18	QRD161J-681	RESISTOR
	R19	QRD161J-681	RESISTOR
	R20	QRD161J-472	RESISTOR
	R22	QRD161J-222	RESISTOR
	R25	QRD161J-474	RESISTOR
	R26	QRD161J-103	RESISTOR
	R27	QRD161J-103	RESISTOR
	R28	QRD161J-102	RESISTOR
	R29	QRD161J-102	RESISTOR
	R30	QRD161J-222	RESISTOR
	R38	QRD161J-152	RESISTOR
	R39	QRD161J-222	RESISTOR
	R109	QRD161J-472	RESISTOR
	R110	QRD161J-472	RESISTOR
	R111	QRD161J-472	RESISTOR
	R112	QRD161J-332	RESISTOR
	R113	QRD161J-105	RESISTOR
	R114	QRD161J-472	RESISTOR
	R115	QRD161J-472	RESISTOR
	R116	QRD161J-472	RESISTOR
	R117	QRD161J-103	RESISTOR
	R118	QRD161J-103	RESISTOR
	C1	QCSB1HJ-150	CAPACITOR
	C3	QCSB1HJ-330	CAPACITOR
	C4	PU57672-400	TRIMMER CAPACITOR, DOT CLK ADJ
	C5	QEK61CM-106	E CAPACITOR
	C7	QER61EM-335	E CAPACITOR
	C8	QCBB1HJ-331	CAPACITOR
	C14	PU57672-300	TRIMMER CAPACITOR, COL CLK ADJ
	C15	QCVB1CN-103	CAPACITOR
	C16	PU57601-335MC	E CAPACITOR
	C17	QCVB1CN-103	CAPACITOR
	C18	QET60JM-107	E CAPACITOR
	C19	QCF11HP-473	CAPACITOR
	C20	QCSB1HJ-560	CAPACITOR
	C101	QCBB1HJ-101	CAPACITOR
	C102	QCBB1HJ-101	CAPACITOR
	C103	QCC11EK-473	CAPACITOR
	L1	PU58333-180K	PEAKING COIL,18 MICRO
	L3	PU48530-101J	PEAKING COIL, 100 MICRO
⚠	CF101	PU60196	RESONETOR
⚠	X1	PU59965	CRYSTAL RESONATOR
	CN101	PU58844-4	CAP HOUSING
	CN102	PU58844-10	CAP HOUSING

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19. TIMER BOARD ASSEMBLY <20>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20171C	TIMER BOARD ASS'Y
	IC1	M50959-616SP	IC
	IC2	M58658P	IC
	IC3	UPC393C	IC
	IC4	S-8053HLB	IC
⚠	Q1	2SC3311A(RS)	TRANSISTOR
	Q2	2SC1685R,S	TRANSISTOR
	Q3	2SC3311A(RS)	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	RD5.6ES-T1B3	ZENER DIODE
	D5	1SS132	DIODE
⚠	D6	RD9.1ES-T1B2	ZENER DIODE
	D7	1SS133	DIODE
	D8	1SS132	DIODE
	R1	QRD161J-122	RESISTOR
	R2	QRD161J-102	RESISTOR
	R3	QRD161J-472	RESISTOR
	R4	QRD161J-474	RESISTOR
	R5	QRD161J-334	RESISTOR
	R6	QRD161J-475	RESISTOR
	R7	QRD161J-105	RESISTOR
	R8	QRD161J-472	RESISTOR
	R9	QRD161J-682	RESISTOR
	R10	QRD161J-104	RESISTOR
	R11	QRD161J-103	RESISTOR
	R12	QRD161J-471	RESISTOR
	R13	QRD161J-473	RESISTOR
	R15	QRD161J-473	RESISTOR
	R16	QRD161J-474	RESISTOR
	R17	QRD161J-103	RESISTOR

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R18	QRD161J-103	RESISTOR
	R19	QRD161J-472	RESISTOR
	R20	QRD161J-472	RESISTOR
	R21	QRD161J-472	RESISTOR
	R22	QRD161J-222	RESISTOR
	R23	QRD161J-684	RESISTOR
	R24	QRD161J-474	RESISTOR
	R33	QRD161J-104	RESISTOR
	R34	QRD161J-102	RESISTOR
	R38	QRD161J-472	RESISTOR
	R39	QRD161J-472	RESISTOR
	R40	QRD161J-472	RESISTOR
	R41	QRD161J-224	RESISTOR
	R42	QRD161J-472	RESISTOR
	R43	QRD161J-472	RESISTOR
	R44	QRD161J-472	RESISTOR
	R45	QRD161J-472	RESISTOR
	R46	QRD161J-472	RESISTOR
	R47	QRD161J-472	RESISTOR
	R48	QRD161J-472	RESISTOR
	R49	QRD161J-472	RESISTOR
	R50	QRD161J-472	RESISTOR
	R51	QRD161J-472	RESISTOR
	R52	QRD161J-472	RESISTOR
	R53	QRD161J-472	RESISTOR
	R54	QRD161J-472	RESISTOR
	R55	QRD161J-472	RESISTOR
	R56	QRD161J-472	RESISTOR
	R57	QRD161J-472	RESISTOR
	R58	QRD161J-472	RESISTOR
	R59	QRD161J-472	RESISTOR
	R61	QRD161J-472	RESISTOR
	R62	QRD161J-472	RESISTOR
	R63	QRD161J-472	RESISTOR
	R64	QRD161J-472	RESISTOR
	R65	QRD161J-472	RESISTOR
	R66	QRD161J-472	RESISTOR
	R67	QRD161J-102	RESISTOR
	R68	QRD161J-224	RESISTOR
	R69	QRD161J-102	RESISTOR
	R70	QRD161J-472	RESISTOR
	R71	QRD161J-472	RESISTOR
	RA1	QRB047J-104	RESISTOR ARRAY
	OR	QRB049J-104	RESISTOR ARRAY
	RA2	QRB047J-224	RESISTOR NETWORK
	OR	QRB049J-224	RESISTOR NETWORK
	RA3	QRB037J-223	RESISTOR NETWORK
	OR	QRB039J-223	RESISTOR NETWORK
	RA5	QRB047J-222	RESISTOR NETWORK
	OR	QRB049J-222	RESISTOR ARRAY
	C1	QEK61CM-336	E CAPACITOR
	C2	QEK61CM-106	E CAPACITOR
	C3	QEK60JM-476	E CAPACITOR
	C4	PU59421-104	E CAPACITOR
	C5	QEK60JM-476	E CAPACITOR
	C6	QCF31HP-103	CAPACITOR
	C7	QEK61CM-106	E CAPACITOR
	C8	QCS31HJ-330	CAPACITOR
	C9	PU57672-400	TRIMMER CAPACITOR, TIMER CLOCK
	C10	QCC11EJ-104	CAPACITOR
	C12	QCF31HP-102	CAPACITOR
	C13	QCF31HP-103	CAPACITOR
	C15	QCB81HJ-102	CAPACITOR
⚠	CF1	PU58428	RESONATOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	OR	PU59576	RESONATOR
⚠	X1	PU58394	CRYSTAL RESONATOR
	SPC1	PU59210-001	W.LOKING SPACER, X2
	TP1	PU56008	TEST-PIN
	TP2	PU56008	TEST-PIN
	TP3	PU56008	TEST-PIN
	TP4	PU56008	TEST-PIN
	TP5	PU56008	TEST-PIN
	CN1	PU58844-4	CAP HOUSING
	CN2	PU60417-8	CAP HOUSING
	CN3	PU60417-6	CAP HOUSING
	CN4	PU58844-102R	CAP HOUSING
	CN5	PU60417-105	CAP HOUSING
	CN6	PU58844-103	CAP HOUSING
	CN9	PU58798-114	FPC CONNECTER
	CN11	PU59555-102	CAP HOUSING

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20. CONTROL BOARD ASSY <24>

REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	PB10107A	CONTROL BOARD ASSY
D401	1SS133	DIODE
D402	1SS133	DIODE
D403	1SS133	DIODE
D404	1SS133	DIODE
D409	1SS133	DIODE
R211	QRD161J-222	RESISTOR
R212	QRD161J-222	RESISTOR
R213	QRD161J-332	RESISTOR
R214	QRD161J-472	RESISTOR
R215	QRD161J-103	RESISTOR
R216	QRD161J-223	RESISTOR
R217	QRD161J-222	RESISTOR
R218	QRD161J-222	RESISTOR
R219	QRD161J-332	RESISTOR
R220	QRD161J-472	RESISTOR
R221	QRD161J-103	RESISTOR
R222	QRD161J-223	RESISTOR
R227	QRD161J-103	RESISTOR
R228	QRD161J-223	RESISTOR
R229	QRD161J-472	RESISTOR
R401	PU60390	V RESISTOR, V. LOCK
R402	PU59092-12	V RESISTOR, P. SHARPNESS
R403	PU59092-2	V RESISTOR, PHONES LEVEL
R404	PU59092-1	SLIDE VOLUME, REC LEVEL (L)(R)
S1	PU59092-14	TACT SWITCH, 1/SUN
S2	PU59092-14	TACT SWITCH, 2/MON
S3	PU59092-14	TACT SWITCH, 3/TUE
S4	PU59092-14	TACT SWITCH, 4/WED
S5	PU59092-14	TACT SWITCH, 5/THU
S6	PU59092-14	TACT SWITCH, 6/FRI
S7	PU59092-14	TACT SWITCH, 7/SAT
S8	PU59092-14	TACT SWITCH, 8/1ST/2ND
S9	PU59092-14	TACT SWITCH, 9/DAILY
S10	PU59092-14	TACT SWITCH, 0/REPEAT
S11	PU59092-14	TACT SWITCH, GO-TO
S12	PU59092-14	TACT SWITCH, ENTER
S13	PU59092-14	TACT SWITCH, COUNTER RESET

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	S14	PU59092-14	TACT SWITCH, CH UP
	S15	PU59092-14	TACT SWITCH, REC/OTR
	S16	PU59092-14	TACT SWITCH, SP/EP
	S17	PU59092-14	TACT SWITCH, DISPLAY
	S18	PU59092-14	TACT SWITCH, CH DOWN
	S19	PU59092-14	TACT SWITCH, SAP REC
	S21	PU59092-14	TACT SWITCH, CLOCK ADJ
	S22	PU59092-14	TACT SWITCH, PROGRAM
	S23	PU59092-14	TACT SWITCH, TIMER
	S24	PU59092-14	TACT SWITCH, CANCEL/SKIP
	S26	PU59092-14	TACT SWITCH, ON SCREEN
	S27	PU59092-14	TACT SWITCH, AM/PM/SC
	S201	PU59092-14	TACT SWITCH, STOP
	S202	PU59092-14	TACT SWITCH, PAUSE/STILL
	S203	PU59092-14	TACT SWITCH, PLAY/X2
	S204	PU59092-14	TACT SWITCH, REW
	S205	PU59092-14	TACT SWITCH, FF
	S206	PU59092-14	TACT SWITCH, VAR. SEARCH (REW)
	S207	PU59092-14	TACT SWITCH, VAR. SEARCH (FWD)
	S208	PU59092-14	TACT SWITCH, AUDIO DUB
	S209	PU59092-14	TACT SWITCH, INSERT
	S211	PU59092-14	TACT SWITCH, ERASE
	S212	PU59092-14	TACT SWITCH, TRACKING -
	S213	PU59092-14	TACT SWITCH, MARK
	S214	PU59092-14	TACT SWITCH, INDEX
	S220	PU59092-14	TACT SWITCH, AUDIO MONITOR
	S221	PU59092-14	TACT SWITCH, TRACKING +
	S222	PU59092-14	TACT SWITCH, S-MODE
	S401	PU59092-6	SWITCH, SOURCE SELECT
	S402	PU54440	SWITCH, COUNT MEMORY
	S403	PU54440	SWITCH, AFC
	S404	QSS1A13-L01	SWITCH, BAND
	S405	PU54440	SWITCH, EDIT
	S406	PU59092-6	SWITCH, LEVEL INDICATOR
	S407	PU54440	SWITCH, ALC
	S408	PU54440	SWITCH, AC ONLINE
	S409	PU54440	SWITCH, AUTO TITLE
	S410	PU54440	SWITCH, VIDEO IN SELECT
	SPC1	PQM30029-104	SPACER
	SPC2	PQM30029-105	SPACER
	WR1	PU36448-3	FLAT WIRE
	WR2	PU60382-1-3	FPC

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21. POWER SWITCH / LED BOARD ASSY <25><32>

	PWBA	PB20193A-01	POWER SWITCH/LED BOARD ASS'Y

-POWER SWITCH BOARD ASSEMBLY < 25 >-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA1	PB20193A1-01	P.SW BOARD ASS'Y
	IC1	GP1U501	INFRATED RAYS UNIT
		OR SPS-413	INFRARED RAYS U
	Q201	DTC114EF	TRANSISTOR
	Q202	DTC114EF	TRANSISTOR
	D1	SLV-31MC3F	LE DIODE
	D2	SLV-31MC3F	LE DIODE
	D201	1SS133	DIODE
	R1	QRD161J-181	RESISTOR
	R2	QRD161J-223	RESISTOR
	R3	QRD161J-332	RESISTOR
	R4	QRD161J-222	RESISTOR
	R5	QRD161J-222	RESISTOR
	R6	QRD161J-471	RESISTOR
	R7	QRD161J-181	RESISTOR
	R201	QRD161J-223	RESISTOR
	C1	QET61AM-476	E CAPACITOR
	C201	QCBB1HJ-102	CAPACITOR
	S1	PU57551	TACT SWITCH
	S2	PU57551	TACT SWITCH
	S3	PU57551	TACT SWITCH
	J1	PU58356-2	JACK(HEADPHONE)
	J2	PU58355-2	MIC JACK
	SLD1	PQ31764	SHADE (LED)
	CN201	PU59513-6	CAP HOUSING

-LED BOARD ASSEMBLY < 32 >-

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA2	PB20193A2	LED BOARD ASS'Y
	Q1	DTC144EF	TRANSISTOR
	D203	SLR-37VR3F	LE DIODE
	D204	SLR-37VR3F	LE DIODE
	D205	SLR-37VR3F	LE DIODE
	D206	SLR-37VR3F	LE DIODE
	D211	SLR-37VR3F	LE DIODE
	D212	SLR-37VR3F	LE DIODE
	D213	SLR-37VR3F	LE DIODE
	D214	SLR-37VR3F	LE DIODE
	D215	GL-3EG43	LE DIODE
	D216	GL-3EG43	LE DIODE
	D217	GL-3EG43	LE DIODE
	D218	GL-3EG43	LE DIODE
	D219	GL-3EG43	LE DIODE
	D220	GL-3EG43	LE DIODE
	D221	GL-3EG43	LE DIODE
	D222	GL-3EG43	LE DIODE
	D223	GL-3EG43	LE DIODE
	D224	GL-3EG43	LE DIODE
	D225	GL-3EG43	LE DIODE
	D227	GL-3EG43	LE DIODE
	D228	GL-3EG43	LE DIODE
	D229	GL-3EG43	LE DIODE
	D230	GL-3EG43	LE DIODE
	D231	GL-3EG43	LE DIODE
	R101	QRD161J-271	RESISTOR
	R102	QRD161J-561	RESISTOR
	R103	QRD161J-561	RESISTOR
	R104	QRD161J-331	RESISTOR
	R105	QRD161J-331	RESISTOR
	R106	QRD161J-821	RESISTOR
	R107	QRD161J-331	RESISTOR
	R108	QRD161J-223	RESISTOR
	SLD2	PQ20548-2	SHADE(LED)

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22. DISPLAY BOARD ASSEMBLY <27>

⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20177B	DISPLAY BOARD ASS'Y
	IC101	MSC7110-01SS	IC
⚠	IC102	MSC1124BRS	IC
	Q1	DTC144EF	TRANSISTOR
	Q2	DTC144ES	TRANSISTOR
	Q3	2SA1309R,S	TRANSISTOR
	Q102	DTC124ES	TRANSISTOR
	Q103	DTA114ES	TRANSISTOR
	D102	1SS132	DIODE
	D103	1SS132	DIODE
	D104	RD8.2ES-T1B2	ZENER DIODE
	D105	1SS132	DIODE
	D106	RD3.0ES-T1B2	ZENER DIODE
	D107	RD24ES-T1B2	ZENER DIODE
	D207	SLH-34VC3F	LE DIODE
	D208	SLH-34VC3F	LE DIODE
	D209	SLH-34VC3F	LE DIODE
	D210	SLH-34VC3F	LE DIODE
	R1	QRD161J-331	RESISTOR
	R2	QRD161J-331	RESISTOR
	R3	QRD161J-103	RESISTOR
	R4	QRD161J-473	RESISTOR
	R101	QRD161J-103	RESISTOR
	R107	QRD161J-393	RESISTOR
	R108	QRD161J-333	RESISTOR
	R111	QRD161J-104	RESISTOR
	R112	QRD161J-103	RESISTOR
	R113	QRD161J-151	RESISTOR
	R114	QRD161J-104	RESISTOR
	R115	QRD161J-103	RESISTOR
	R116	QRD161J-151	RESISTOR
	R117	QRD161J-103	RESISTOR
	R118	QRD161J-103	RESISTOR
	R119	QRD161J-103	RESISTOR
	R209	QRD161J-181	RESISTOR
	R210	QRD161J-181	RESISTOR
	RA101	QRB037J-472	RESISTOR NETWORK
	C101	QCC11EJ-473	CAPACITOR
	C102	QER61HM-104	E CAPACITOR
	C103	QCBB1HJ-101	CAPACITOR
	C104	QER61HM-105	E CAPACITOR
	C105	QER61HM-475	E CAPACITOR
	C106	QER61HM-225	E CAPACITOR
	C107	QFJ41HJ-223	M CAPACITOR
	C108	QER61CM-106	E CAPACITOR
	C109	QER61CM-106	E CAPACITOR
	C110	QEK60JM-227	E CAPACITOR
	C111	QCF31HP-473	CAPACITOR
	C112	QCF31HP-223	CAPACITOR
	C113	QER41VM-106	E CAPACITOR
	FDP1	PU59952	FLUORESCENT DISPLAY PANEL
	HD1	PQ43223	LED HOLDER
	HD2	PQ31309	FDP HOLDER (L)
	HD3	PQ31310	FDP HOLDER (R)

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN5	PU59513-4	CAP HOUSING
	CN6	PU59555-103	CAP HOUSING

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23. STEP BOARD ASSEMBLY <37>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB30052A-01	STEP BOARD ASS'Y
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	1SS133	DIODE
	D4	1SS133	DIODE
	R1	QRD162J-152	RESISTOR
	R2	QRD162J-332	RESISTOR
	R3	QRD162J-103	RESISTOR
	R4	QRD162J-103	RESISTOR
	CN1	PU58798-126	FFC CONNECTOR
	CN7	PU58844-3Y	CAP HOUSING

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24. UPPER DRUM BOARD <41>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB1	PDM3161	UPPER DRUM BOARD,X2

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25. PRE/REC AMP BOARD ASSEMBLY <43>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB10079A-01	PRE/REC AMP BOARD ASS'Y
	IC1	HA118019NT	IC
	IC2	VC2034	IC
		OR VC2034-2	IC
	IC3	AN6392	IC
	IC4	BU4030BF	IC
	Q1	2SC2412K	TRANSISTOR
	Q2	2SC2412K	TRANSISTOR
	Q11	2SA1037K	TRANSISTOR
	Q12	2SA1037K	TRANSISTOR
	Q13	DTC144EK	TRANSISTOR
	Q14	DTC144WK	TRANSISTOR
	Q15	DTA124EK	TRANSISTOR
	Q16	DTC144EK	TRANSISTOR
	Q17	DTA124EK	TRANSISTOR
	Q21	DTC124EK	TRANSISTOR
	Q101	2SC2412K	TRANSISTOR
	Q102	2SA1037K	TRANSISTOR
	Q103	2SC2412K	TRANSISTOR
	Q104	2SC2412K	TRANSISTOR
	Q105	2SC2412K	TRANSISTOR
	Q106	2SC2412K	TRANSISTOR
	Q107	2SA1037K	TRANSISTOR
	Q108	2SC2412K	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q109	2SC2412K	TRANSISTOR
	Q110	2SA1037K	TRANSISTOR
	Q111	2SC2412K	TRANSISTOR
	Q112	2SC2412K	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D5	DAN202K	DIODE
	D6	DAN202K	DIODE
	D7	1SS133	DIODE
	D8	1SS133	DIODE
	D101	1SS133	DIODE
	D102	1SS133	DIODE
	D103	1SS133	DIODE
	D104	1SS133	DIODE
	R1	QRSA08J-122YN	RESISTOR
	R2	QRSA08J-122YN	RESISTOR
	R3	QRSA08J-560YN	RESISTOR
	R4	QRSA08J-560YN	RESISTOR
	R5	QRSA08J-180YN	RESISTOR
	R6	QRSA08J-390YN	RESISTOR
	R7	QRSA08J-103YN	RESISTOR
	R8	QRSA08J-474YN	RESISTOR
	R9	QRSA08J-122YN	RESISTOR
	R10	QRSA08J-122YN	RESISTOR
	R11	QRSA08J-334YN	RESISTOR
	R12	QRSA08J-223YN	RESISTOR
	R13	QRSA08J-223YN	RESISTOR
	R16	QRSA08J-223YN	RESISTOR
	R29	QRSA08J-333YN	RESISTOR
	R45	QRSA08J-271YN	RESISTOR
	R46	QRSA08J-102YN	RESISTOR
	R47	QRSA08J-102YN	RESISTOR
	R50	QRSA08J-623YN	RESISTOR
	R51	QRSA08J-271YN	RESISTOR
	R52	QRSA08J-121YN	RESISTOR
	R53	QRSA08J-102YN	RESISTOR
	R54	QRSA08J-223YN	RESISTOR
	R55	QRSA08J-183YN	RESISTOR
	R56	QRSA08J-273YN	RESISTOR
	R57	QRSA08J-222YN	RESISTOR
	R58	QRSA08J-821YN	RESISTOR
	R59	QRSA08J-222YN	RESISTOR
	R60	QRSA08J-103YN	RESISTOR
	R61	QRSA08J-103YN	RESISTOR
	R68	QRSA08J-393YN	RESISTOR
	R69	QRSA08J-393YN	RESISTOR
	R71	QRSA08J-104YN	RESISTOR
	R72	QRSA08J-102YN	RESISTOR
⚠	R73	PU52108-150	POSISTOR
⚠	OR	PU52108-150T	POSISTOR
⚠	R74	PU52108-2R2	POSISTOR
⚠	OR	PU52108-2R2T	POSISTOR
	R75	QRD182J-183	RESISTOR
	R76	QRD161J-822	RESISTOR
	R101	QVZ3521-222	V RESISTOR, EP PB EQ (S-MODE)
	R102	QRSA08J-102YN	RESISTOR
	R103	QRSA08J-102YN	RESISTOR
	R104	QRSA08J-561YN	RESISTOR
	R105	QRSA08J-561YN	RESISTOR
	R106	QRSA08J-182YN	RESISTOR
	R107	QRSA08J-561YN	RESISTOR
	R108	QRSA08J-392YN	RESISTOR
	R109	QRSA08J-471YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R110	QRSA08J-102YN	RESISTOR
	R111	QRSA08J-223YN	RESISTOR
	R112	QRSA08J-333YN	RESISTOR
	R113	QRSA08J-681YN	RESISTOR
	R114	QRSA08J-103YN	RESISTOR
	R115	QRSA08J-393YN	RESISTOR
	R116	QRSA08J-153YN	RESISTOR
	R117	QRSA08J-153YN	RESISTOR
	R118	QVZ3521-222	V RESISTOR, SP PB EQ (S-MODE)
	R119	QRSA08J-102YN	RESISTOR
	R120	QRSA08J-102YN	RESISTOR
	R121	QRSA08J-561YN	RESISTOR
	R122	QRSA08J-561YN	RESISTOR
	R123	QRSA08J-122YN	RESISTOR
	R124	QRSA08J-561YN	RESISTOR
	R125	QRSA08J-122YN	RESISTOR
	R126	QRSA08J-102YN	RESISTOR
	R128	QRSA08J-273YN	RESISTOR
	R129	QRSA08J-102YN	RESISTOR
	R130	QRSA08J-561YN	RESISTOR
	R131	QRSA08J-821YN	RESISTOR
	R132	QRSA08J-681YN	RESISTOR
	R133	QRSA08J-681YN	RESISTOR
	R134	QRSA08J-821YN	RESISTOR
	R135	QRSA08J-561YN	RESISTOR
	R136	QRSA08J-471YN	RESISTOR
	R137	QRSA08J-102YN	RESISTOR
	R138	QRSA08J-333YN	RESISTOR
	R139	QRSA08J-223YN	RESISTOR
	C3	QCFA1HZ-103	CAPACITOR
	C4	QCFA1HZ-103	CAPACITOR
	C5	QETC0JM-476	E CAPACITOR
	C6	QCY81EK-223ZL	CAPACITOR
	C7	QCYA1HK-152	CAPACITOR
	C10	PU59758-105	CAPACITOR
	C11	PU59758-105	CAPACITOR
	C14	QCYA1HK-152	CAPACITOR
	C15	QCYA1HK-152	CAPACITOR
	C16	QCSA1HJ-471	CAPACITOR
	C18	PU59758-105	CAPACITOR
	C19	PU59758-105	CAPACITOR
	C21	QCSA1HJ-121	CAPACITOR
	C22	QCYA1HK-152	CAPACITOR
	C24	QCFA1HZ-103	CAPACITOR
	C25	QETC1HM-104	E CAPACITOR
	C26	QCFA1HZ-103	CAPACITOR
	C27	QCSA1HJ-121	CAPACITOR
	C28	QCSA1HJ-331	CAPACITOR
	C29	QCSA1HJ-391	CAPACITOR
	C31	QETC0JM-476	E CAPACITOR
	C32	QCFA1HZ-103	CAPACITOR
	C39	QER61EM-475	E CAPACITOR
	C41	QER60JM-476	E CAPACITOR
	C50	QCFA1HZ-103	CAPACITOR
	C51	QCFA1HZ-103	CAPACITOR
	C52	QCFA1HZ-103	CAPACITOR
	C53	QETC1CM-476	E CAPACITOR
	C54	QFN31HJ-223	M CAPACITOR
	C55	QCC11EJ-103	CAPACITOR
	C56	QETC1HM-105	E CAPACITOR
	C57	QCSA1HJ-470	CAPACITOR
	C58	QCFA1HZ-103	CAPACITOR
	C59	QCFA1HZ-103	CAPACITOR
	C61	QETA1AM-476	E CAPACITOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C101	QCSA1HJ-270	CAPACITOR
	C103	QCSA1HJ-390	CAPACITOR
	C104	QCSA1HJ-150	CAPACITOR
	C105	QCSA1HJ-390	CAPACITOR
	C106	QCSA1HJ-180	CAPACITOR
	C108	QCSA1HJ-820	CAPACITOR
	C109	QCSA1HJ-820	CAPACITOR
	C110	QCFA1HZ-103	CAPACITOR
	C111	QCFA1HZ-103	CAPACITOR
	C112	QCSA1HJ-270	CAPACITOR
	C113	QCSA1HJ-470	CAPACITOR
	C115	QCSA1HJ-180	CAPACITOR
	C116	QCSA1HJ-120	CAPACITOR
	C117	QCSA1HJ-180	CAPACITOR
	C118	QCSA1HJ-101	CAPACITOR
	C119	QCSA1HJ-121	CAPACITOR
	C120	QCSA1HJ-330	CAPACITOR
	C122	QCSA1HJ-330	CAPACITOR
	C123	QCSA1HJ-120	CAPACITOR
	C124	QCSA1HJ-220	CAPACITOR
	C125	QCFA1HZ-103	CAPACITOR
	C126	QCFA1HZ-103	CAPACITOR
	C127	QCFA1HZ-103	CAPACITOR
	C130	QCSA1HJ-470	CAPACITOR
	C131	QCSA1HJ-470	CAPACITOR
	L1	PU48530-101K	PEAKING COIL, 100 MICRO
	L2	PU59152-330J	PEAKING COIL, 33 MICRO
	L3	PU59152-181J	PEAKING COIL, 180 MICRO
	L4	PU48530-101K	PEAKING COIL, 100 MICRO
	L6	PU48530-101K	PEAKING COIL, 100 MICRO
	L15	PU59153-101K	INDUCTOR, 100 MICRO
	L16	PU59152-100J	PEAKING COIL, 10 MICRO
	L101	PU59152-470J	PEAKING COIL, 47 MICRO
	L102	PU59152-120J	PEAKING COIL, 12 MICRO
	L103	PU59152-390J	PEAKING COIL, 39 MICRO
	L104	PU59152-221J	PEAKING COIL, 220 MICRO
	L105	PU59152-100J	PEAKING COIL, 10 MICRO
	L106	PU59152-470J	PEAKING COIL, 47 MICRO
	L107	PU59152-120J	PEAKING COIL, 12 MICRO
	L108	PU59152-330J	PEAKING COIL, 33 MICRO
	L109	PU59152-100J	PEAKING COIL, 10 MICRO
	L110	PU59152-150J	PEAKING COIL, 15 MICRO
	L111	PU59152-330J	PEAKING COIL, 33 MICRO
	L112	PU59152-220J	PEAKING COIL, 22 MICRO
	L113	PU59152-390J	PEAKING COIL, 39 MICRO
	BKT1	PQ42955	BOARD BRACKET
	ETH1	PQ40433-2	EARTH LUG
	ETH2	PQ43375-1-1	EARTH PLATE
	SCW1	DPSP2606Z	SCREW, X2
	SCW2	DPSP2606Z	SCREW
	SLD1	PQ43376A-1	SHIELD CASE
	SLD2	PU60154	SHIELD PLATE
	SLD3	PU60153-2-1	SHIELD CASE
	SPC1	PU59210-001	W.LOKING SPACER, X3
	SPC2	WBS2600Z	T.L.WASHER
	WR1	PW30109-50AAZZ7	PARALLEL WIRE
	TP	PU56008	TEST-PIN, X3
	CN1	PU56258-10	CAP HOUSING
	CN2	PU58844-4	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING
	CN4	PU58844-4	CAP HOUSING
	CN5	PU58844-9	CAP HOUSING

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26. FLYING ERASE BOARD ASSEMBLY <46>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB30045A	FLYING ERASE BOARD ASSY
⚠	Q1	2SA933S	TRANSISTOR
	Q2	2SC1741S(QR)	TRANSISTOR
	Q3	2SA933S	TRANSISTOR
	Q4	2SD639R	TRANSISTOR
	Q5	2SD639R	TRANSISTOR
	D1	UZ8.2BSC	ZENER DIODE
	D2	1SS133	DIODE
	R1	QRD161J-473	RESISTOR
	R2	QRD161J-472	RESISTOR
	R3	QRD161J-222	RESISTOR
	R4	QRD161J-473	RESISTOR
	R5	QRD161J-472	RESISTOR
	R6	QRD161J-104	RESISTOR
	R7	QRD161J-121	RESISTOR
	R8	QRD161J-104	RESISTOR
	R9	QRD161J-121	RESISTOR
	C1	QCVB1CN-103	CAPACITOR
	C2	QCC11EJ-123	CAPACITOR
	C3	QCSB1HJ-560	CAPACITOR
	C4	QCBB1HJ-820	CAPACITOR
	C6	QCBB1HJ-820	CAPACITOR
	C8	QCT25UJ-181	CAPACITOR
	C9	QCT05UJ-330	CAPACITOR
	L1	PU48530-560J	PEAKING COIL, 56 MICRO
	L2	PU48530-3R3K	PEAKING COIL, 3.3 MICRO
	L3	PU48530-3R3K	PEAKING COIL, 3.3 MICRO
	L4	PU59152-101J	PEAKING COIL,100 MICRO
	T1	PU56175	S.TRANS
	SLD1	PU60408	SHIELD CASE
	SLD2	PU60409	SHIELD COVER
	SLD3	PU60410	SHIELD PLATE
	CN1	PU58844-3	CAP HOUSING
	CN2	PU58844-2	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING

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27. SYNC SEP/SUB SERVO BOARD ASSEMBLY <49>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB30060B	SYNC SEP/SUB SERVO BOARD ASSY

-SYNC SEP SECTION-

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	IC1	M52684P	IC
		OR M52684AP	IC
	IC2	BU4013B	IC
		OR TC4013BP	IC

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q1	DTC114ES	TRANSISTOR
	R1	QRD161J-152	RESISTOR
	R2	QRD161J-271	RESISTOR
	R3	QRD161J-103	RESISTOR
	R4	QRD161J-103	RESISTOR
	C1	QER61HM-105	E CAPACITOR
	C2	QER61CM-106	E CAPACITOR
	C3	QCSB1HJ-220	CAPACITOR
	C4	QCXB1CN-152	CAPACITOR
	C5	QCVB1CM-103	CAPACITOR
	C6	QCVB1CM-103	CAPACITOR
	C7	QFN31HJ-222	M CAPACITOR
	C9	QCVB1CM-103	CAPACITOR
⚠	CF1	PU60086	RESONATOR
	CN1	PU58844-5	CAP HOUSING

-SUB SERVO SECTION-

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q102	DTC124ES	TRANSISTOR
	CN101	PU58844-2Y	CAP HOUSING
	CN103	PU58844-2R	CAP HOUSING
	CN105	PU58844-2Y	CAP HOUSING

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28. DECK TERMINAL BOARD ASSEMBLY <51><53>

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PB20013C-03	DECK TERMINAL BOARD ASSEMBLY

-DECK TERMINAL BOARD ASSEMBLY <51>-

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA1	PB20013C1	DECK TERMINAL BOARD ASSY
	R1	QRD181J-151	C RESISTOR
	R3	QRD181J-331	C RESISTOR
	PHS1	PU60271	P.INTERRUPTER
	CN1	PU59933-17	WIRE TRAP

-REC SAFETY BOARD ASSEMBLY <53>-

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA3	PB20013A3	REC SAFETY BOARD ASSY
	S1	PU58644-1-3	REC SAFETY SWITCH

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29. RELAY BOARD ASSEMBLY <52>

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA2	PB20013A2	RELAY BOARD ASSY
	LC1	PU59736-223	N FILTER
	LC2	PU59736-223	N FILTER
	WR2	PW30113-G0ABZ62	PARALLEL WIRE

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30. END SENSOR BOARD ASSEMBLY <54>

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA4	PB20013A4	END SENSOR BOARD ASSY
	Q1	PN268R-NC	PHOTO TRANSISTOR
	HD1	PQ31047	END SENSOR HOLDER
	CN1	PU59945-102	WIRE SOCKET

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31. CASSETTE HOUSING BOARD <56>

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB1	PB30043	CASSETTE HOUSING BOARD
	Q1	PN268R-NC	PHOTO TRANSISTOR
	R1	QRD161J-471	RESISTOR
	PHS1	PU58879	PHOTO INTERRUPTER
	CN1	PU58844-106	CAP HOUSING

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32. REMOTE CONTROL BOARD ASSEMBLY <RM>

# ⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB A	PQ10607-1	REMOCON BOARD ASSY
	IC1	M50565-014FP	IC
	Q1	2SD601R,T,W	CHIP TRANSISTOR
	Q2	2SA822(RS)	CHIP TRANSISTOR
	D1	SE303A4	LE DIODE
	D2	SE303A4	LE DIODE
	D3	MA151A	DIODE, (1/2)
	D4	MA151A	DIODE, (1/2)
	D5	MA151A	DIODE, (1/2)
	D6	MA151A	DIODE, (1/2)
	D7	MA151A	DIODE, (1/2)
	D8	MA151A	DIODE, (1/2)
	D9	MA151A	DIODE, (1/2)
	D10	MA151A	DIODE, (1/2)
	D11	MA151WK	DIODE, (1/2)
	D12	MA151WK	DIODE, (1/2)
	D13	MA151WK	DIODE, (1/2)
	D14	MA151WK	DIODE, (1/2)
	D15	MA151WK	DIODE, (1/2)
	D16	MA151WK	DIODE, (1/2)
	D17	MA151WK	DIODE, (1/2)
	D18	MA151WK	DIODE, (1/2)
	D19	MA151WK	DIODE, (1/2)
	D20	MA151WK	DIODE, (1/2)
	D21	MA151WK	DIODE, (1/2)
	D22	MA151WK	DIODE, (1/2)
	D23	MA151WK	DIODE, (1/2)
	D24	MA151WK	DIODE, (1/2)
	D25	MA151WK	DIODE, (1/2)
	D26	MA151WK	DIODE, (1/2)
	D31	MA151WA	DIODE, (1/2)
	D32	MA151WA	DIODE, (1/2)
	X1	CSB455EB1T	CERAMIC RESONATOR
	S129	PQ10607-2	SLIDE SWITCH
	TML1	PQ10607-3	BATTERY TERMINAL, (+)
	TML2	PQ10607-4	BATTERY TERMINAL, (–)